

# THE IRON AGE

## Contents

JUNE 29, 1939

Uncle Sam—Proprietor .....	15
Centrifugal Casting of Metal and Alloys .....	17
Gray and Malleable Iron .....	21
What's New .....	24
Pin Hole Detector .....	26
Gigantic Extrusion Press .....	29
Compactness Featured in New Handling Apparatus .....	30
Report of American Electroplater's Society .....	36
Machine Tool Show .....	40
Magnesium—The "Flyweight" Structural Material .....	42
On the Assembly Line .....	44
Washington News .....	48
THE NEWS IN BRIEF .....	58
Weekly Ingot Operating Rate .....	67
Rate of Activity in Capital Goods .....	67
Plant Expansion and Equipment Buying .....	84

New Industrial Literature .....	10
Just Between Us Two .....	92
Products Advertised .....	93
Index to Advertisers .....	114

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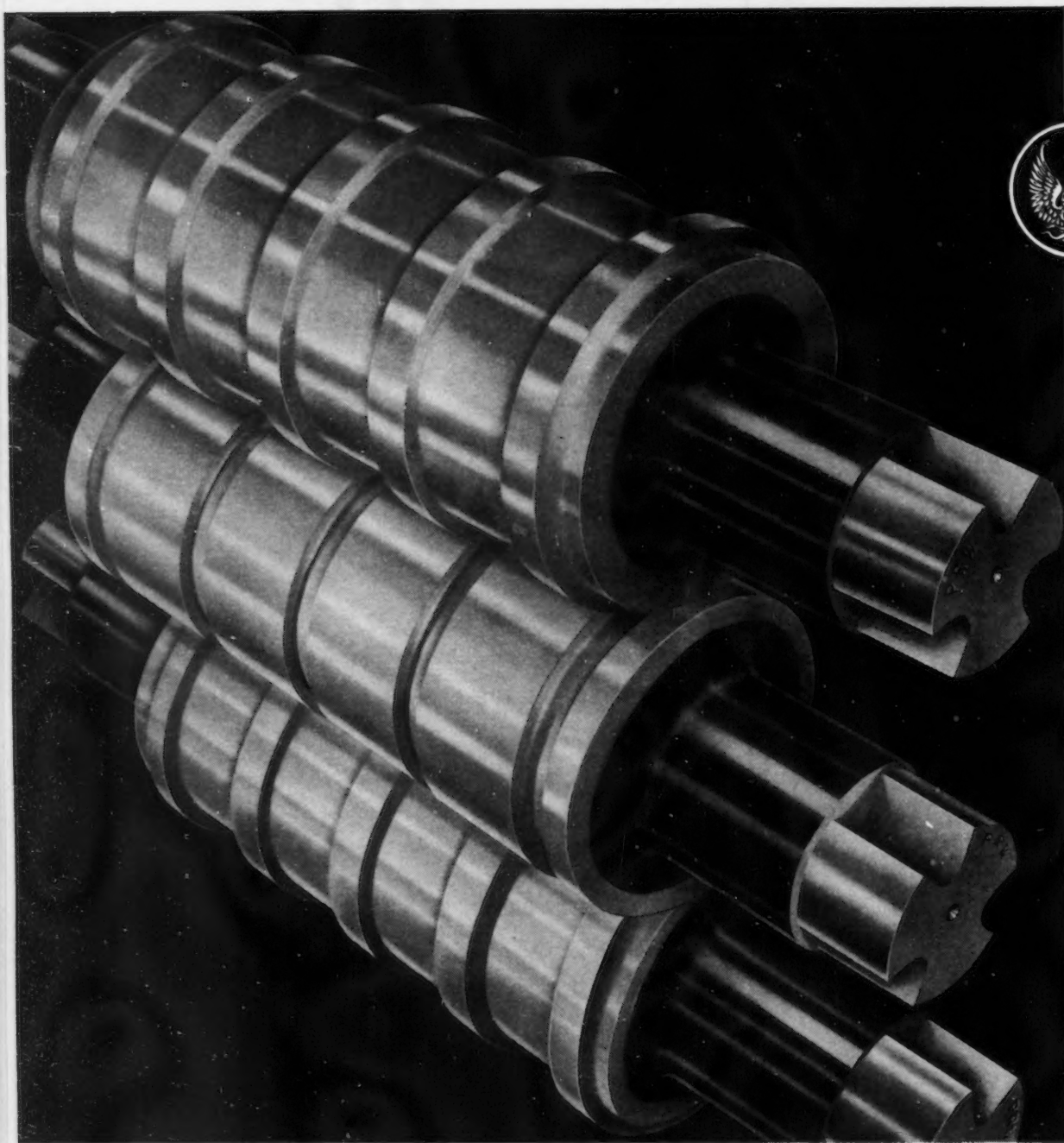
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# THE IRON AGE

**JUNE 29, 1939**

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## Uncle Sam — Proprietor

AST week on this page we posed a question. It was: "What qualifications of Government, as it is now constituted, lead to the assumption that it is fitted either to reform or to run private enterprise?" We pointed out that in the matter of financial management, Government has recorded a dismal failure. And in the matter of picking executive heads for its important enterprises, all of the mistakes and boners of private enterprise could not marshal anywhere near as large an army of clucks and Kuklucks as Government, in recent years, has pitchforked on to the public payroll.

"But," a reader writes us, "why speculate upon such a remote possibility? Surely our Government has no intention of assuming the ownership and management of private business."

We reply: "So that's what you think." And we quote the statement made by the Assistant Secretary of State of the United States, a man of the sacred inner circle and one who should know what the New Deal has in mind, if anyone does. Here is what Adolf Augustus Berle, Jr., told the members of the Temporary National Economic Committee recently:

"If wealth is to be created by the creation of Government debt, the scope of Government enterprise must be largely increased. The Government will have to enter into the direct financing of activities now supposed to be private. And a continuation of that direct financing must inevitably be that the Government ultimately will control and own those activities. . . . Over a period of years, the Government will gradually come to own most of the productive plants of the United States."

A blunt, flat, final and conclusive statement of what's going to happen if we cannot balance the budget, and there isn't the slightest indication that the New Deal is trying to. Uncle Sam is to take off the striped trousers and his star-banded hat and put on a pair of overalls with the hammer and sickle embroidered on the back.

So then what? That's a fair question. And it leads to some others.

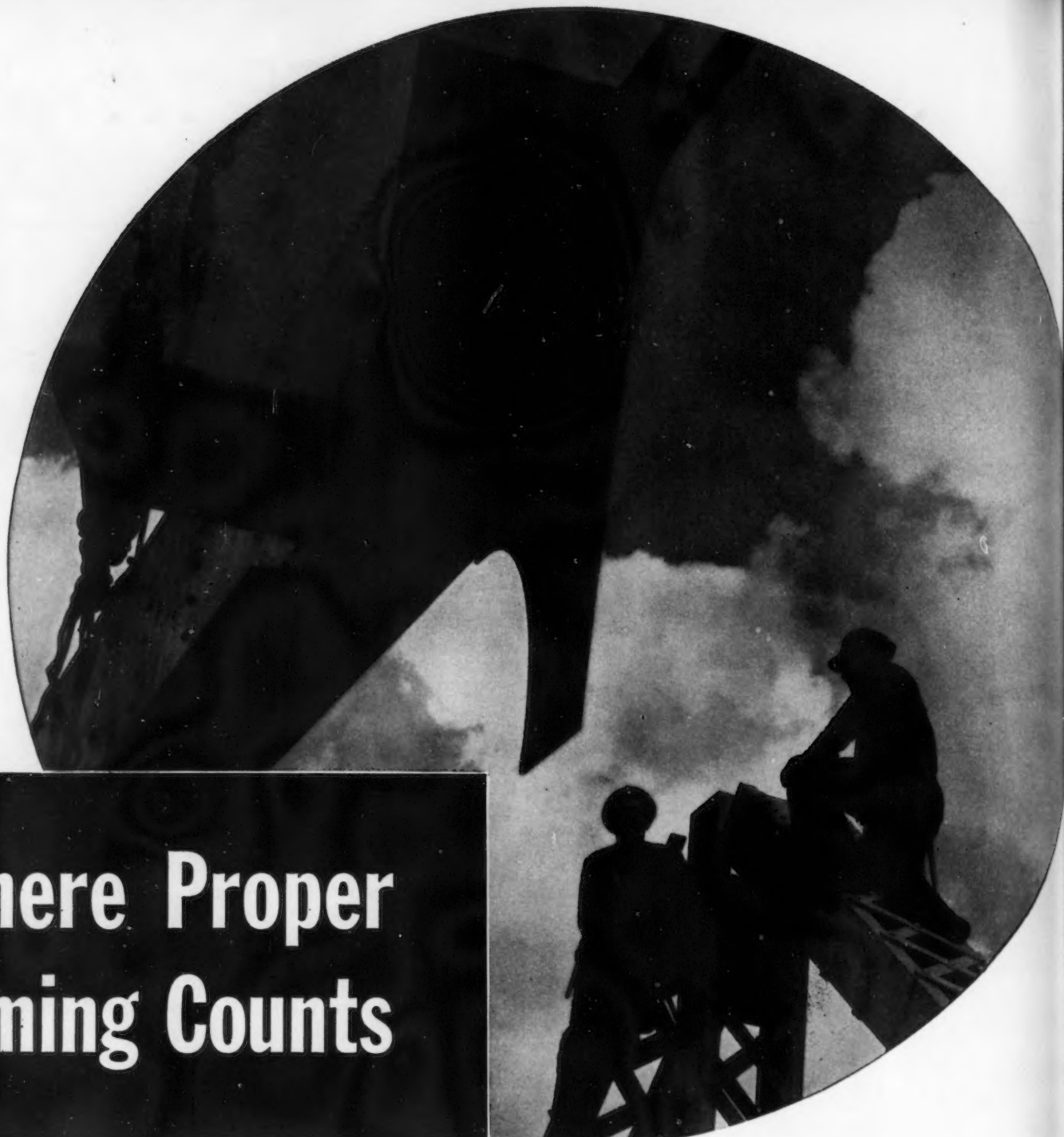
One question is as to the method through which Government will acquire the ownership of what is now private enterprise. Will it be by buying the present owners out or freezing them out?

Perhaps the plans have already been definitely laid to accomplish this objective. Can it be that the buying-out process is already in operation, as indicated in the utilities field? Or the freezing-out process as indicated by the bankrupting of contractors through WPA competition? Or the bleeding of assets from corporations through the tremendous expenditures required for defense of Labor Board kangaroo court proceedings?

And can it be that even now the American millions who visit the New York World's Fair are being "prepared" for the coming of Communism through the most elaborate, expensive and spectacular propaganda exhibit ever attempted in the history of mankind?

The threads seem to begin to fall into place and reveal a pattern. Who are they who have designed the tapestry?

J. H. Wamsley



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# Centrifugal Casting



## of Metal and Alloys

**A**N early British Patent dated 1809 in the name of Anthony Eckhardt of Soho, Birmingham, claims the invention of a centrifugal casting process embodying "the use of molds revoluble with their axes either vertical, inclined or horizontal in order that centrifugal force due to the revolution may press the fluid metal against the interior surfaces of the mold and more perfect castings thereby produced." The use of a grooved cylindrical mold with longitudinal grooves in its interior surface and revolving about a horizontal axis was claimed also for production of straight bars.

While there are a number of different processes of centrifugal casting in commercial operation today the broad principles outlined in this early patent are common to them all. In operation, the centrifugal casting process is applied to castings of an essentially cylindrical character. The mold is arranged to rotate with its central axis either vertical, inclined or horizontal. The internal periphery of the mold is of the shape of the external form of the casting required. No core is used or required for the formation of the main internal surface of the casting and suitable end closing walls are provided to prevent the displacement of the liquid metal in the direction of the axis of rotation. The molten metal is introduced into the rotating mold by suitable means and the centrifugal forces resulting from the rotation of the liquid metal tend to distribute it towards the inner pe-

By J. E. HURST  
Lichfield, England

• • •

riphery of the mold. When solidified, the metal produces a hollow casting, the external shape of which corresponds to that of the internal shape of the mold. The internal bore of the casting as defined by the end walls of the mold is either truly cylindrical or of a more or less paraboloidal form in those cases where the mold is rotated about an axis inclined to the horizontal.

In the commercial application of the process, its limitation to castings of a cylindrical character by no means restricts its importance and commercial value. Closer acquaintance with the process rapidly discloses that its applications are very much larger than one would suppose. Many engineers

and designers have been intrigued by the possibilities of this process and have undertaken development and experimental work with a view to adapting the process to their specific requirements. The centrifugal process is now applied in industrial countries to the production of castings in cast iron, steel, and non-ferrous alloys.

### Different Processes

A number of different types of processes for the production of centrifugal castings are in commercial operation. In all cases the casting machines can be considered conveniently under the following three essential headings:

(a) The means adopted for the rotation of the mold.

(b) The method of pouring or introduction of metal into the mold.

(c) The form and construction of the mold.

(a) *The means adopted for the rotation of the mold:* The most important aspect of the methods adopted for the rotation of the mold which warrants consideration here is the axis of rotation. In the principal processes in commercial operation, rotation of the mold about its horizontal axis or an axis slightly inclined to the horizontal, is adopted. Rotation about the vertical axis is used also to a limited extent for the production of cylindrical castings of comparatively short lengths, as for example phosphor bronze worm wheel

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IN this the first section of a two-part article, the author describes the history and present status of various centrifugal casting processes. In the second section to appear next week, Mr. Hurst will discuss the role of the centrifugal process in the refining of pig iron.

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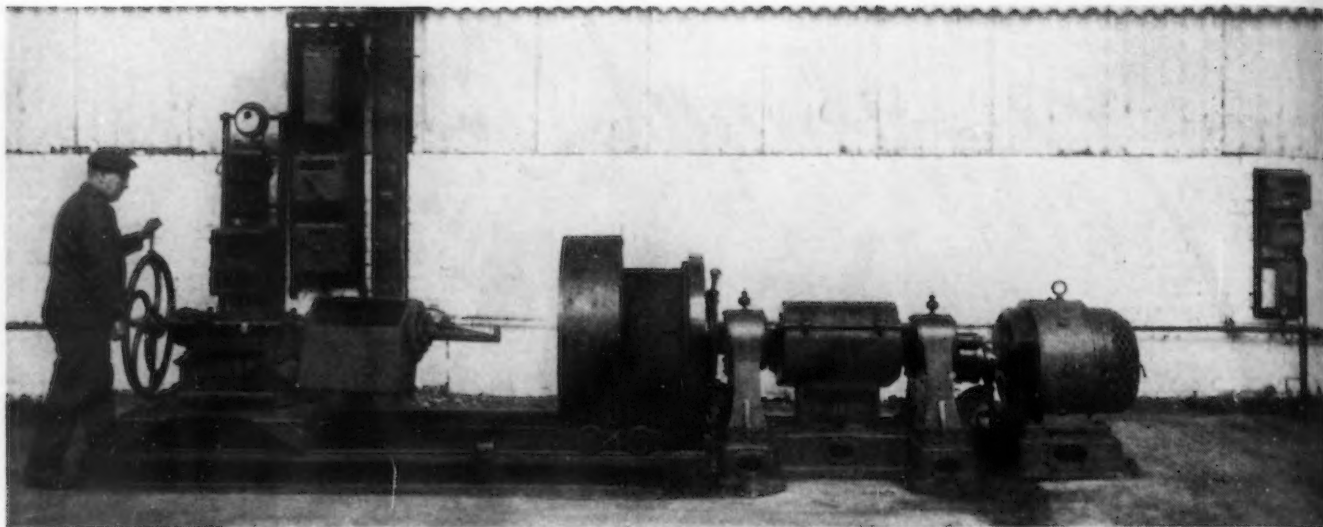


FIG. 3—Centrifugal casting machine at Sheepbridge Stokes Centrifugal Castings Co., Ltd.

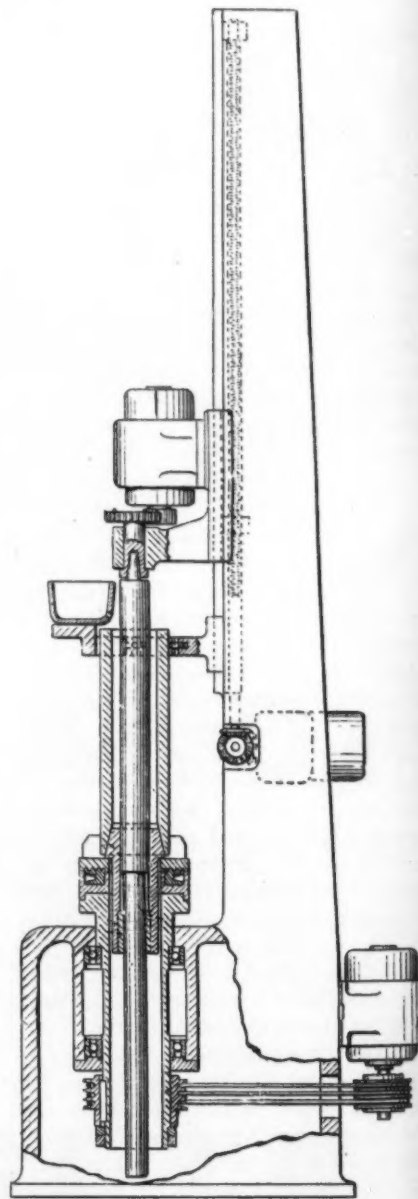
blanks. There are one or two exceptions to this—the process known as the Billand process, proposed by a German inventor for the production of long lengths of standard straight pocket pipe in cast iron, is one of these. A most ingenious adaptation of the vertical spinning lies in the invention of Meek of John Holroyd & Co. Ltd., which has been very successfully applied to the production of cored bars in phosphor bronze. In the Holroyd machine, as described in British Patent No. 411,113, the rotating mold, rotating about the vertical axis, is provided with a rotating metal core which can be withdrawn parallel to the vertical axis coincident with the filling of the mold. Provision is of course necessary for the synchronization of all the movements as is indicated diagrammatically in the sketch Fig. 1.

From experience, the general rule would appear to be that spinning about the vertical axis should be adopted for the production of those cylindrical castings in which the radial thickness is exceptionally great in comparison with the length, e.g., wheels, locomotive piston heads, gear wheel blanks, thick section annular bushes and ingots. As a matter of fact, the method of rotation about the vertical axis is adopted in the commercial processes for the manufacture of bronze worm wheels, steel wheels and similar castings. Rotation about an axis steeply inclined to the horizontal was practiced for the production of short length piston ring drums by the Ford Motor Co. in America. There does not appear to be any particular advantage in this

method of spinning. A lower speed of rotation can be used in this case than in the case of the vertical axis; but this has to be set off against increased complexity in the machine design. In the two principal commercial processes for the production of pipe, a comparatively slight inclination of the axis of rotation to the horizontal has been adopted.

(b) *The method of pouring:* In pouring a quantity of liquid into a rotating mold, no matter in what fashion, provided the liquid remains liquid, it will eventually become evenly distributed over the surface of the mold, and assume a condition of equilibrium in which, in the case of spinning about the horizontal axis, the inside surface is truly cylindrical. In the case of liquid metal which is only liquid for a short period of time, before it becomes finally solid, and moreover, during this period is increasing in viscosity at a rapid rate, the time available for the liquid metal to take up a condition of equilibrium over the whole surface of the mold is extremely limited.

For the production of castings uniform in bore and thickness, it is necessary that the molten metal shall have sufficient time to distribute itself evenly, or some method of pouring adopted in which this time element is rendered of less importance in determining the even distribution of the metal. The method of introducing the molten metal into the rotating mold is the principal feature which differentiates the various systems of centrifugal casting. In the majority of systems where it is required to produce castings to close limits of



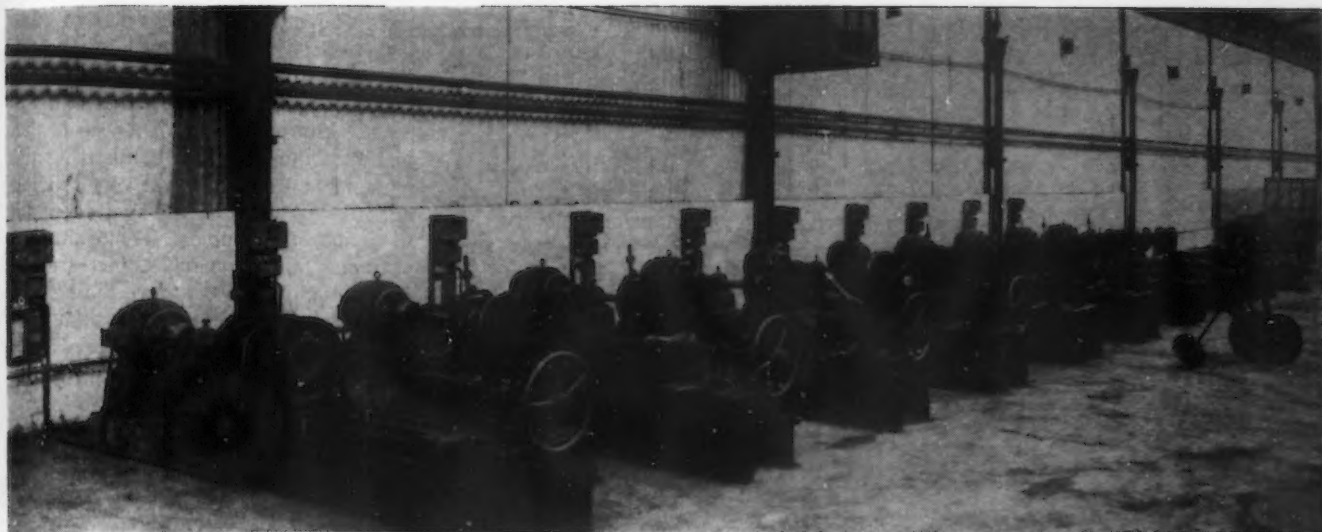


FIG. 4—Layout of foundry for the production of centrifugally cast cylinder liners.

dimensional accuracy, and particularly where metal molds are used, the method of pouring is the most vital and important feature of the process. Where the limits of accuracy are not so close and where the castings are of short lengths and comparatively bulky, the method of pouring is not nearly of such vital importance.

The earliest method of introducing molten metal into molds rotating about the horizontal axis was the use of some form of a bent funnel. Such a bent funnel suitably mounted, projecting into the die parallel to the axis of rotation allows the molten metal poured from an ordinary ladle

to be directed onto the surface of the mold in a continuous stream. The even distribution of the whole liquid metal over the surface of the mold is acquired by the movement of the liquid metal over the surface of the mold in a direction parallel to the axis of rotation. This movement is brought about purely by the forces originating from the rotation of the liquid metal itself. The magnitude of these forces and consequently the rapidity with which these movements are brought about and completed, depends upon the rapidity with which the molten metal acquires rotational velocity in the first instance. The time available,

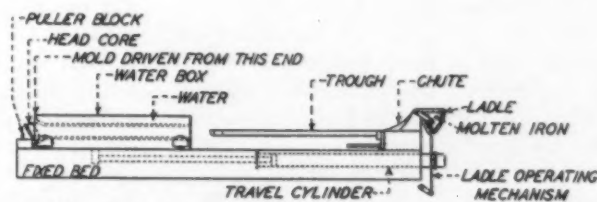
while the metal remains liquid for rotational velocity to be acquired and for uniform longitudinal distribution to take place, is so short that in practice this method of pouring is only successful when applied to the production of short length castings having a large radial thickness.

With the object of reducing the length of time required for the molten metal to distribute itself evenly over the whole length of the mold, the obvious method of pouring at several points or over the whole length of the mold simultaneously, constitutes the next development. In this manner the distribution of the metal over the length of the mold parallel to the axis of rotation becomes more or less independent of the forces due to the rotation of the liquid metal. The apparatus used to effect such distribution takes a variety of forms and has been developed along various lines by different inventors. The simplest form is a tilting trough of cylindrical cross-section, in which a portion of the cylinder wall is cut away in such a manner as to form a horizontal weir edge of approximately the length of the casting to be produced. This trough is mounted in such a manner as to enable it to be tilted or partially rotated about its longitudinal axis, and is either large enough in itself to hold sufficient metal for the production of the casting, or is attached to some external reservoir containing molten metal.

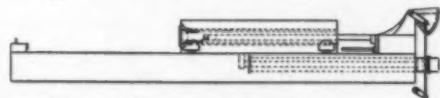
From the early days of centrifugal casting it has been recognized that for the production of long castings of even thickness, the introduction of the molten metal must be effectively con-

AT LEFT

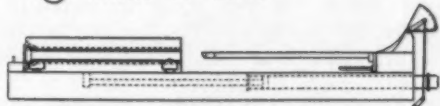
FIG. 1—Holroyd vertical centrifugal casting machine. A rotating metal core is withdrawn parallel to the vertical axis of the rotating mold coincident with the filling of the mold.



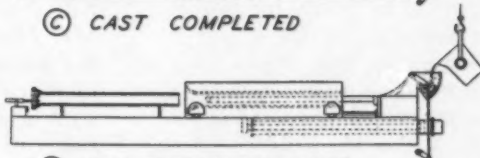
(A) HEAD CORE PUT IN PLACE



(B) START OF CAST



(C) CAST COMPLETED



(D) PIPE EXTRACTED LADLE REFILLED

AT RIGHT

FIG. 2—De La-vaud casting machine. Diagrammatic view showing sequence of operations (Stuart).



trolled. It is apparent from the early patents—and experiment confirms the fact—that the introduction of molten metal in a long flat continuous stream of approximately the same length as the casting is difficult to control from the point of view of the ultimate uniform even thickness of the pipe.

With the object of acquiring still greater control over the pouring operation, the use of a stream of metal of comparatively narrow width combined with means for applying this stream to the surface of the mold was contemplated by various inventors. The methods adopted in almost every case utilize the means of relative longitudinal movement between the mold and the metal stream itself. This will be understood readily from the description of three typical cases. In 1891, Lane designed a machine in which the stream of metal was allowed to issue from the end of a tubular spout and at the same time the mold was continuously withdrawn over the spout. The effect of this relative longitudinal movement between the mold and pourer spout is such that provided the movements are properly synchronized, the stream of metal is continuously deposited over the whole surface of the rotating mold.

Briede, in Germany in 1912, designed a machine embodying this relative longitudinal movement between the pourer spout and the mold. These systems of relative longitudinal movement between the mold and a narrow stream of molten metal have culminated in the modern system, invented by Sensaud de Lavaud and known as the Lavaud system. This is the system extensively adopted for the production of cast iron pipe.

A diagrammatic illustration of the Lavaud machine as used in the manufacture of cast iron pipe is given in Fig. 2. The mold while rotating is moved longitudinally in a direction away from the end of the pourer. It can be imagined readily that if this longitudinal movement is correctly synchronized with the rotational speed of the mold the metal issuing from the end of the pourer will cover the whole of the surface of the mold. If, in addition to this, provision is made for the molten metal to be delivered from the pourer at a uniform and controllable rate, then the casting will be of uniform and controllable thickness. The segmental shape of the tilting ladle is specially designed to supply uniform quantities of metal to the pourer trough.

The Billand process, which has

been referred to previously, operates on a similar principle—but in this case the whole operation is conducted with the mold rotating about the vertical axis.

The sand-spun processes, as they are now called, utilize sand molds and the methods of pouring adopted in conjunction with such molds take advantage of the longer period of solidification under these conditions.

The Moore sand-spun process developed by W. D. Moore, of the American Cast Iron Pipe Co. and the Sand-Spun Patents Corp., is specially interesting and has been adopted extensively in various countries. This method combines all the advantages of sand molds with that of the centrifugal casting process. An important aspect of the Sand-Spun process lies in the longer time during which the metal remains molten while under the influence of centrifugal pressure.

*(c) The form and construction of the molds:* The use of sand molds, produced more or less in the ordinary manner, has been resorted to since the earliest date of the art of centrifugal castings. In the centrifugal casting of non-ferrous alloys, sand molds have been consistently adopted. One of the principal reasons for the use of sand molds is their low initial cost, a factor of vital importance where the total number of castings would not justify the cost of a metal mold. In the case of the production of castings in cast iron, the use of sand molds presents one method of avoiding trouble due to the formation of chilled hard white iron surfaces.

The centrifugal process lends itself admirably to the use of metal molds and in some of the principal processes in commercial operation, such metal molds are used. In the Lavaud process for the production of cast iron pipe, an alloy steel mold adapted for water cooling is used. In this process the castings are submitted to a subsequent heat treatment in the shape of an annealing or normalizing process.

In those processes operating with metal molds on the production of general castings, no water cooling is adopted. In practice, the molds attain suitable temperature and heat conditions to produce castings definitely free from chill. The credit for production of centrifugal castings in gray machineable cast iron free from chill on a commercial basis utilizing metal molds is to be ascribed to Stokes Castings Ltd., Mansfield. Cammen, in America, has proposed the use of hot metal molds. Cammen recommends

mold temperature of the order of 1380 deg. to 2160 deg. F., depending on the thickness of the casting—the thinner the casting, the higher the temperature. His primary object appears to be not so much that of eliminating the presence of chill as that of securing even distribution of the molten metal in long-length molds. According to Cammen, the primary object of the mold should be to conserve the heat of the molten metal, and with this view the author is in direct opposition. The mold should be regarded primarily as a means for absorbing or dissipating the heat of the molten metal. The mold should be designed in such a manner that the heat absorbed from the casting is absorbed at such a rate that the rate of cooling of the metal through the critical range of temperature is not sufficiently quick to prevent the formation of the graphite. If these conditions can be obtained, then the castings will be free from chill.

Experience has definitely shown that these conditions can be obtained, using metal molds either water cooled or air cooled for any given composition of cast iron within the limits of the ordinary grades of iron used in foundry practice. Furthermore, a much lower temperature than that recommended by Cammen can be utilized to prevent the formation of chill, and gray machineable castings are produced under conditions where the inner surface temperature of the mold does not exceed 930 deg. F. In the case of castings 4 in. diameter by  $\frac{3}{8}$  in. thick, castings are produced daily at the rate of 15 per hr. over a period of 8 hr. without the above maximum temperature being exceeded. In no case has any annealing been necessary and all the castings are soft gray and readily machineable, the silicon content of the iron used not exceeding 2.20 per cent.

An illustration of the type of machine in use for the production of general castings embodying the design and principles in use at the Sheepbridge Stokes Centrifugal Castings Co. Ltd., Chesterfield, England, is illustrated in Fig. 3. A typical example of the layout of a general centrifugal casting foundry is shown in Fig. 4.

**Ed. Note — Next week Mr. Hurst will complete his discussion of centrifugal casting technique with a description of the role of the centrifugal casting procedure for the refining of pig iron.**



# GRAY

*and*

# MALLEABLE IRON

By ENRIQUE TOUCEDA

IN the first section of this two-part article, the author discussed the history of gray iron difficulties, and then described changes made in manufacture which resulted in high-grade castings made to consumer specifications. In this last section, the malleable industry is examined, and all recent innovations in manufacture are dealt with.

THE early situation in the malleable iron industry paralleled in large measure that which existed in the gray iron foundries, and as a matter of fact all other foundries at that time. The making of cupola gray iron castings involves a more or less simple melting operation, in which the composition of the molten metal at the spout differs but slightly from that of the mixture charged into the cupola. That is, about the only changes in chemical composition that take place during the melting operation in the cupola is an actual loss of from 20 to 25 points in silicon, a loss of about one-third the manganese contained in the mixture, and a gain in sulphur depending upon the amount of that element in

the coke, there being no positive control over the total amount of carbon that will remain in the castings. If, however, a large percentage of steel is used in the mixture, with tuyeres rather close to the bottom, the melting being hot and rapid, a carbon content of 3 per cent or slightly under that figure can be obtained.

The metallurgy of that process, therefore, is simple indeed as compared with that which takes place in either the first or second step of the malleable iron process, the first step of which is the making of white iron castings free from even traces of graphite and that in other respects also must be of appropriate composition for treatment in the second step. The second step is to effect a complete and profound change in both chemical composition, structural composition, and mechanical properties of the white iron castings through a thermal treatment called the annealing process.

Charcoal pig iron was the basic raw material used in the production of the white iron castings because it was believed that coke iron could not be used as a substitute. Both the air furnace and cupola were employed as melting units, the latter being used to a smaller extent and only for the production of small castings such as pipe fittings, saddlery hardware, etc.

In connection with the tensile properties of the product at this time the

ultimate strength and elongation respectively were of the order of 38,000 to 45,000 lb. per sq. in. and 2 to 3 per cent, the cupola iron being somewhat less strong and tough than that from the air furnace. At the time referred to, the air furnace mixture was made up of charcoal pig iron, sprue and home or purchased malleable iron scrap, the mixture running rather high in total carbon, a large part of which was in the form of graphite. The air furnace was fired with bituminous coal and the charge was subjected to the oxidizing action of the furnace atmosphere until such amounts of silicon and carbon were eliminated as would cause all of the carbon in the molten bath of metal to be present in the combined form when the heat was ready to be tapped, at which time the metal should have been hot enough to run castings without fear of misruns, provided the silicon in the mixture had been correctly proportioned.

Such was the metal from which the extremely hard and brittle castings were made, and which subsequently must be heat treated in order that they will be converted into a product that is strong, ductile and tough. From this very brief description it can be seen that the metallurgical operations are very complex as compared with the simple melting operations in the cupola.

Inasmuch as the malleable founder

during this period did not know what metallurgical changes were taking place during either step in the process, the character of castings that were made varied largely in toughness, strength, and appearance of fracture. As they had practically no knowledge of the chemical reactions that occurred in the air furnace, but did know that the castings had to consist of white iron, their whole reliance as to when the furnace should be tapped was determined by an inspection of the fracture of the test specimens taken from the molten bath of metal at about one-half-hour periods, the time for tapping being considered correct when the fracture of a specimen finally showed no trace of specks of primary graphite on the one hand, and on the other the metal was sufficiently hot to run the castings without danger of misruns.

However, they were not at the time aware of the fact that if the iron was free from any evidence of primary graphite, that fact did not necessarily mean that the white iron in other respects was of suitable composition for the annealing operation, for the silicon as well as the carbon and manganese might have been too low to allow for an efficient anneal and the castings still be thoroughly white.

### Annealing Studied

A like situation in respect to the reaction that took place in the annealing oven existed, with the results that when the annealed castings had an abnormal fracture or lacked strength and toughness the founder was at a loss as to the cause, for the annealer blamed the melter and the latter blamed him.

This was the situation up to some 25 years ago when steps were taken to ferret out through metallurgical investigations the real causes for the trouble that was being experienced. That is, a study was made by competent metallurgists of the reactions that occurred in both the melting unit and annealing oven with the result that this information gradually became familiar to most of those in charge of the plants and by the men responsible for the quality of the product.

Somewhat prior to this time it had been found by certain investigators that if coke iron, of a composition comparable with that of the charcoal iron, was used, no trouble would be experienced in its being substituted in the mixture for the other type. This actually can be considered to have been about the first improvement that took place in the industry, while the

second was a fairly accurate understanding, first, in regard to the allowable limits for the different constituents in the mixture such as would yield a white iron composition best suited for the annealing operation, and subsequently a knowledge of the metallurgical principles involved in the melting and annealing units.

Covering the advancements that have been made in metallurgical apparatus, it can be stated that these have been gradual but very outstanding, in that not only have far reaching improvements been made in air furnace construction, but to a greater extent in annealing oven design, construction and practice.

Regarding the former, the hand fired air furnace has practically been outmoded in favor of the pulverized coal fired unit, with a more positive control over the time in which the heats can be gotten out and in a yielding of a much better fuel ratio. The changes that have taken place in annealing oven design and construction have been more radical, both in connection with a saving in fuel and in the shortening of the time in which the castings can be delivered to the customer, who has constantly been demanding an improvement in this particular.

In the early days all of the ovens were of the intermittent type, were not under pyrometric control nor were they insulated, a situation that started to be corrected around 1916. The castings invariably were placed in cast iron pots in which they were surrounded with an oxidizing packing, the joints of which were luted with clay while the surface of the top pot was protected in the same manner.

The pots filled with castings were taken from the annealing room floor one by one and placed in rows in the oven, an operation that was time consuming, and the emptying of the oven even more so at the end of the anneal; for it was then necessary to allow the oven temperature to drop to a point at which the men could safely enter the oven. The procedure was about as follows:

The oven was charged—firing started—temperature raised to the maximum degree desired, which would be in the vicinity of 1600 to 1650 deg. F.—this temperature was maintained for from 60 to 80 hr.—temperature was then dropped to 1400 deg. as rapidly as possible, but which, under the conditions, necessarily was very slow—from 1400 deg. the temperature had to be lowered at a rate no faster than 10 deg. per hr. until a temperature around

1290 deg. was reached—this temperature had to be maintained for at least 20 hr., after which the pots could be withdrawn when the oven temperature was down to a point where this proved practical. About 8 days was the average length of an anneal from the time firing started until the pots were dumped.

It is obvious that if means were devised to shorten the time in which the oven could be loaded and unloaded at the conclusion of the anneal, many hours' time could be saved. If, in addition to this, the time required to allow the temperature to drop from its maximum to around 1400 deg. could be lessened, more time would be saved. Ovens have been designed and are now in use that admit of both of these details being carried out, and in addition they can be charged at a time when they are at a temperature of around 1200 deg. instead of at atmospheric temperature, with a further saving of some 12 to 15-hr. time. Further than this, some ovens instead of being run intermittently are of the continuous type and are run with a controlled atmosphere in which scaling and excess decarburization does not occur, in spite of the fact that the castings are not enclosed in pots.

These improvements have gone hand in hand with increase in a metallurgical knowledge of the process, with a great increase in the quality of the product, with improvements in the melting and annealing units, in sand conditioning and handling, and in many other mechanical details such as mold conveyors, etc.

Owing to labor conditions and due to the introduction of the mold conveyor and the economies that would result from the continuous pouring of metal, the duplex system has been installed in quite a number of the plants, which also has resulted in minimizing some of the hard labor in the foundry. Two units are used in the operation, a cupola in which the mixture is melted, and an air furnace into which the molten metal from the cupola is allowed to flow through a short trough that connects the two and in which it is brought to the proper white iron composition desired. No metal is withdrawn from the air furnace until it has been filled to capacity, and as during this interval the latter is kept continuously under fire, a sufficient amount of silicon and carbon will have been eliminated to bring about the proper composition desired in the white iron. From this point on, the amount of molten metal flowing from the cupola into the air furnace is ad-

justed to the amount that is withdrawn from the latter for distribution to the molds. Frequent control analyses are made from both units in order that the metal will be of uniform composition throughout the run.

It would be too long a story to recount all of the many improvements that have taken place even within the last few years.

### Properties Greatly Improved

Covering the improvements that have taken place in the quality of the product, it has been pointed out that some 25 years ago its tensile properties were exceedingly low. As soon, however, as the technique of the process became better understood, and with the improvement in metallurgical apparatus, the mechanical properties gradually were increased and for the past 15 years the average yield point and elongation of the test bars from the majority of the plants in the industry have been 36,000 lb. per sq. in. and 18 per cent respectively. There are, however, a substantial number of plants whose test bars will run much higher in elongation, that is will average around 23 per cent, while it is not of rare occurrence to have bars run occasionally as high as 27 per cent and at times as high as 33 to 35 per cent. The improvements that have been made in the mechanical properties can best be illustrated by refer-

ence to the American Society for Testing Materials Specification A-47-33, grades No. 32510 and No. 35018, the lower grade calling for a minimum yield point and elongation of 32,500 lb. per sq. in. and 10 per cent, while the higher one calls for 35,000 lb. per sq. in. and 18 per cent, particularly when it is considered that these specifications were adopted wholly on the request of the industry and not by the trade.

There are, however, other valuable properties inherent in the product, the foremost of which is the ease with which it can be machined, for these operations can be performed at a considerably greater speed than in the case of any ferrous product of equal tensile properties. As an illustration of what can be accomplished in this direction the following cases can be taken as examples.

At one concern where a 1½ in. air hose nipple was being threaded, these were being chased on the rough surface with a self opening die at the rate of 420 per hr., while on cylinder caps such as are used to protect the valves of high pressure cylinders, 150 per hr. were being tapped. At another plant a 1 15/32-in. drill was being run at a 256 r.p.m. with a 0.106 surface speed per minute and a 0.008 in. cut per revolution, while at this same plant a 1 1/32-in. drill was making 326 r.p.m. at 90 ft. per min. and 0.008

in. cut per revolution. Also, 20,000 locomotive grease plugs were being machined with only three grindings of the chaser, which is a fair illustration of what is being done by way of speeds and tool wear.

Another valuable characteristic possessed by the product has to do with its rust resistance properties.

The industry has in its possession many examples that show the rust resistance properties of malleable iron.

A characteristic example is in the case of a metal fence in Buffalo, N. Y., erected and painted in 1914, the posts of which are made up of two short pieces of steel pipe that screw into two malleable iron tees, into which are screwed two horizontal steel pipes between which are steel ornamental scrolls, this assembly forming the panels.

There is a malleable iron flange at the bottom of the post and a spherical malleable iron casting at its top. It easily can be seen on passing, that many of the steel members have been eaten completely through one of their sides, while a careful examination of the malleable iron castings show that during these many years they have not been affected.

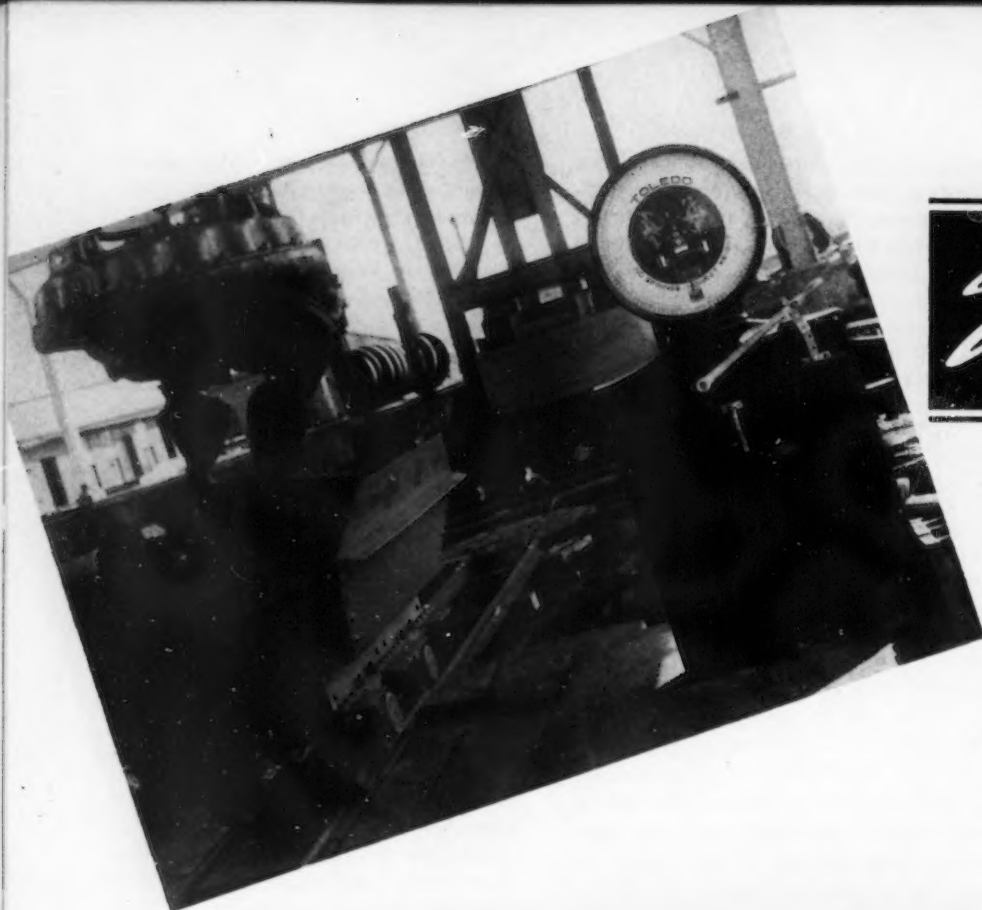
Another instance is the case of a malleable iron pole mounting at Bridgeport, Conn., that after 10 years' exposure to alternate salt water and

(CONCLUDED ON PAGE 83)

THE hand fired air furnace for melting malleable iron has practically been outmoded in favor of the pulverized coal fired unit, such as this 25-ton installation.







## What's

### AT LEFT

TO obtain quick and accurate readings when weighing the charges going into its furnace, the Griffin Wheel Co., Chelsea, Mass., recently installed a model 1700 heavy duty Toledo scale. To facilitate checking of weight when a pre-determined standard has been set, the scale dial has been equipped with adjustable pointers and faced to the right so that it provides a reading surface in direct line with the eyes of those in charge of this operation.

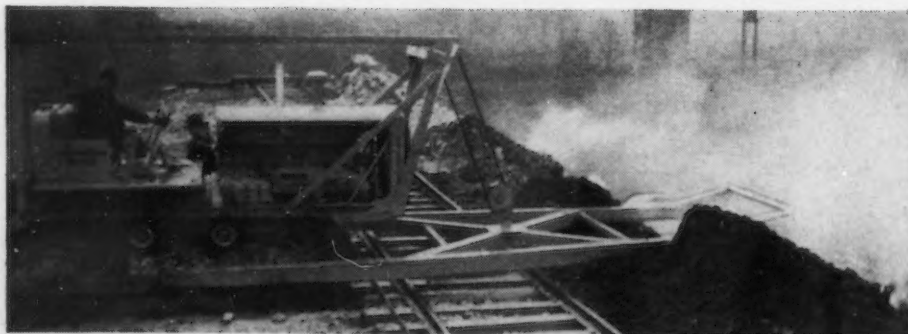
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THIS 51,000-lb. grinding mill was so designed by Allis-Chalmers Mfg. Co., Milwaukee, that it could be broken down into sections measuring no more than  $3\frac{1}{2} \times 4\frac{1}{2} \times 14$  ft., with a maximum weight of 5000 lb. The machine will be flown into the interior of Nicaragua to handle gold ore. The assembled continuous tooth, herringbone driving gear measures over 11 ft. in diameter.



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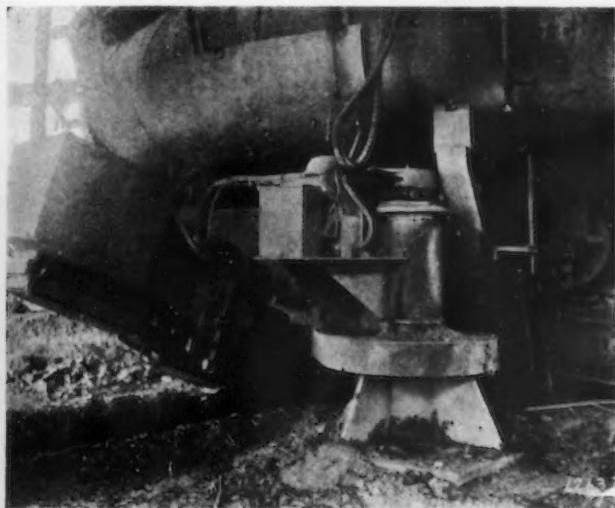
TIMKEN ROLLER BEARING CO. uses a Caterpillar tractor to aid in the disposal of slag. A 95 hp. tractor is equipped with a standard bulldozer blade mounted on arms extending  $17\frac{1}{2}$  ft. in front of the idler, with the cutting edge  $13\frac{1}{2}$  in. below the bottom of the push arms. When slag is dumped along the edge of the pit from railroad cars, the tractor drops the blade over the track right at the edge of the ties. The blade settles until the push arms rest on the rails, and then the hot slag is pushed over the edge of the pit.



# New!

## BELOW

**D**ESIGNED to meet the demand of blast furnace operators for a clay gun which will be independent of the furnace structure, this pedestal-type gun has recently been developed by Edgar E. Brosius, Inc., Sharpsburg, Pa. The gun, with its crane, is mounted on a pedestal secured to a foundation erected at the side of the trough, and is swung to and away from the tapping hole by a motor on a bracket at the top of the pedestal. The motor transmits its power through a worm and spur gear reducer to a pinion which is meshed to a stationary gear attached to the pedestal.



## AT RIGHT

**T**HE heart of a television set is the cathode ray tube, on the face of which is traced the image. The elements of this tube, made by A. B. Dumont Laboratories, comprise an intricate assembly of cylinders, deflecting plates and a cathode. These parts are made of nickel—pure nickel supplemented by nickel alloys such as "K" Monel and Inconel. These metals fulfill manufacturing and operating demands, such as ease of spot welding, elasticity and strength at high temperatures, ever rustproof, and of desirable electrical properties and low in contained gas.



o o o

## AT LEFT

**S**STREAMLINING the business end of a towing tug. Kort nozzles are incorporated in the stern by arc welding, and Oertz streamlined patent rudders are incorporated in the nozzle. Rudder and guards are easily taken off to permit removal of propellers and tailshafts. Photo courtesy of Wilson Welder & Metals Co., Inc.

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# PIN HOLE *Detector*

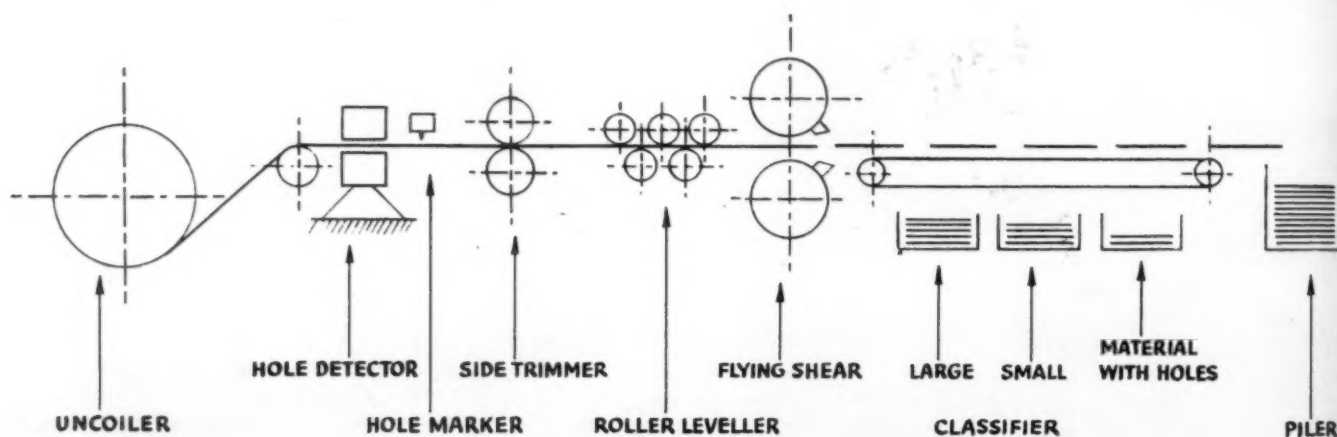
**T**HE modern method of making tin plate is to take coils of steel rolled in a hot strip mill and, after pickling to remove scale and dirt, roll the steel in a tandem cold mill. A typical schedule will start with steel 0.06-in. thick and reduce it to a thickness of 0.01 in. If a small piece of scale is left on the steel after

pickling or some other foreign material gets on the steel while it is being rolled, it will be rolled into the steel. Later, it will likely drop out of the thin material and leave a small pin hole.

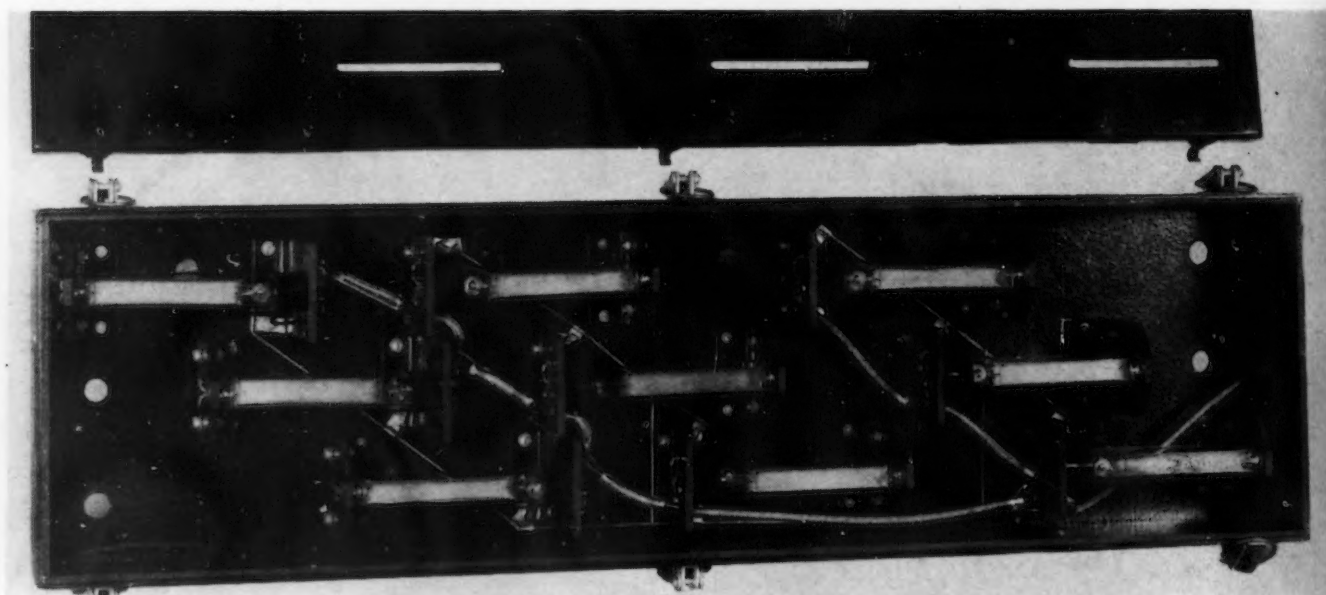
The same thing may occur in any flat rolled product such as copper, aluminum, brass or the various alloys.

A device called a pin hole detector has been developed which will locate these pin holes in the steel and at the same time make a mark at the location of the hole. This marking is desirable as the hole itself may be so small that it will not be noticed during a normal inspection.

The operation of the pin hole detec-



**FIG. 1**—Schematic diagram of pin hole detector used in a tin plate shearing line.



**FIG. 2**—Arrangement of photo tubes in housing.



## 0.015-IN. HOLE IN FLAT ROLLED PRODUCTS DETECTED AT 100 TO 1000 FT. PER MIN.

tor is based on the characteristic of a light sensitive photo tube. The gas filled tube causes a very small current to flow when light strikes it. Therefore, if the strip of steel is placed between a photo tube and an intense light source, no light will fall on the photo tube if the sheet is perfect, but if there is a hole in the sheet, a beam of light will shine through onto the photo tube and cause the current to flow in the tube. Even though the current is very small, the amplifier on the control panel amplifies the current to a value sufficient to operate relays to give the sequence of operation desired.

This use of a photo tube and light source is the same as used in the well known Phototroller or light relay, and the pin hole detector is simply a special kind of Phototroller designed to meet a specific set of conditions.

After tin plate is rolled in the cold mill, it is annealed and given a final tempering pass in a rolling mill, and then is ready to be tinned. For the tinning operation the coil of steel is cut into short pieces 24 to 36 in. long and the sheets tinned individually.

The shearing line used for cutting the coil strip into short lengths is a

convenient place for detecting the holes and separating the imperfect sheets from the good sheets. A typical layout is shown in the schematic diagram in Fig. 1.

Various possible combinations of the pin hole detector may be used of which the following are typical:

(1) In conjunction with a hole marker only, which simply marks the location of the hole. In this case the pieces have to be separated later from the other material, but can be readily identified because they are marked.

(2) In conjunction with a hole marker and a standard classifier. The classifier operates with a suitable device to reject over-gage and under-gage sheets. Some units have one pocket for the over-gage and one for the under-gage, and others simply put all off-gage sheets in a common pocket. The sheets with holes can be put in any of these pockets and then discarded later as they are marked.

(3) In conjunction with a classifier having an additional pocket besides those for under and over-gages, and into which pocket the pieces with holes are discharged. The hole marker in this case may or may not be used as desired.

By G. A. CALDWELL

Industrial Division, Westinghouse  
Electric & Mfg. Co.

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The various units that go to make up the complete hole detector are as follows:

Hole Detector: Light source, photo tube housing, and control unit.

Marker: Control unit, operating solenoid, and tachometer generator.

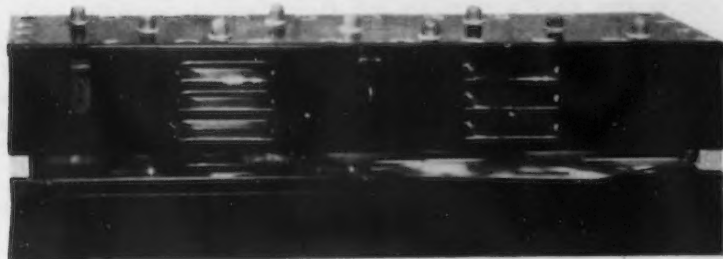
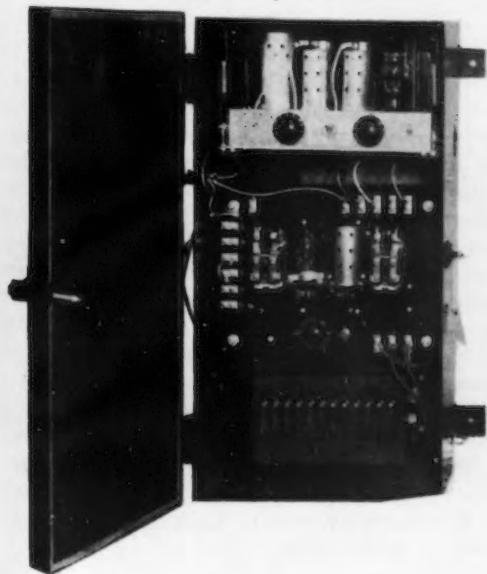
The photo tube housing is mounted on a solid base independent of the mounting of the shearing line. This is important in that vibration of the photo tubes is eliminated. The housing is made from heavy plates, and the slots in the cover for the entrance of the beam of light are covered with glass so that the unit is dust-tight.

Since the entire width of the strip must be scanned for holes, it is essential to have in effect a photo tube as long as the width of the strip. Since there are no photo tubes of this length, it is necessary to use a type of tube as long as available and use a sufficient number to cover the width of strip to be scanned. The inside view of a typical photo tube housing for 36-in. wide sheet is shown in Fig. 2. There are a total of nine photo tubes connected in parallel in this unit and they are mounted in such a way that light will fall on one of these photo tubes regardless of the location of the hole in the strip.

In some of the original units, the light source consisted of two ordinary

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FIG. 3 — Arrangement of the light source above the photo tube housing at the right. The control panel is at the left.



1500-watt Mazda lamps mounted in suitable reflectors, which were located approximately 10 to 12 in. above the strip. This light source gave ample light to detect holes as small as 1/32-in. in diameter, but for smaller holes a light source with several lamps and focusing lenses has been developed. The original unit also produced considerable illumination and the glare of light reflected from the sheet was sometimes undesirable.

The improved light source is mounted about 1 in. above the photo tube housing, leaving a slot for the strip to pass through, and has a line filament lamp and condensing lens for each photo tube. They are mounted in the same relative positions directly above their respective photo tubes. The light source is provided with a visual indicator for each lamp to indicate whether all lamps are burning, it thus being unnecessary to open the cover. The lamps are operated at reduced voltage to insure long life. This unit is shown in Fig. 3.

The control panel shown in Fig. 3 consists of the necessary amplifier and rectifier tubes complete with auxiliary relays and adjusting rheostats to properly control and interpret the signals received from the photo tube housing. The relays can be used to either set up the proper circuits for the marking device or else control the gates on the classifier.

It is evident that if the steel is traveling at a rather high speed, the light shining through the hole will only strike the photo tube momentarily, the approximate time being 0.001 sec. at 1000 ft. per min. and the total amount of light will be very small. In order to make the unit independent of the variations in tube characteristics, the control panel responds to the rate of change in light striking the photo tube. This arrangement makes the unit more sensitive and, contrary to what might be expected, the unit is actually capable of detecting smaller holes when the strip is traveling at 400 ft. per min., than it is capable of detecting at 100 ft. per min. This is a desirable feature since a speed of 400 ft. per min. represents more nearly operating conditions than does a speed of 100 ft. per min.

As previously indicated, the marking device consists of a solenoid, a speed indicating generator and control panel. This equipment is shown in Fig. 4. The purpose of the marker is to automatically make a mark on

the sheet at the approximate point of the hole so that it can be readily detected during the tinning process and discarded.

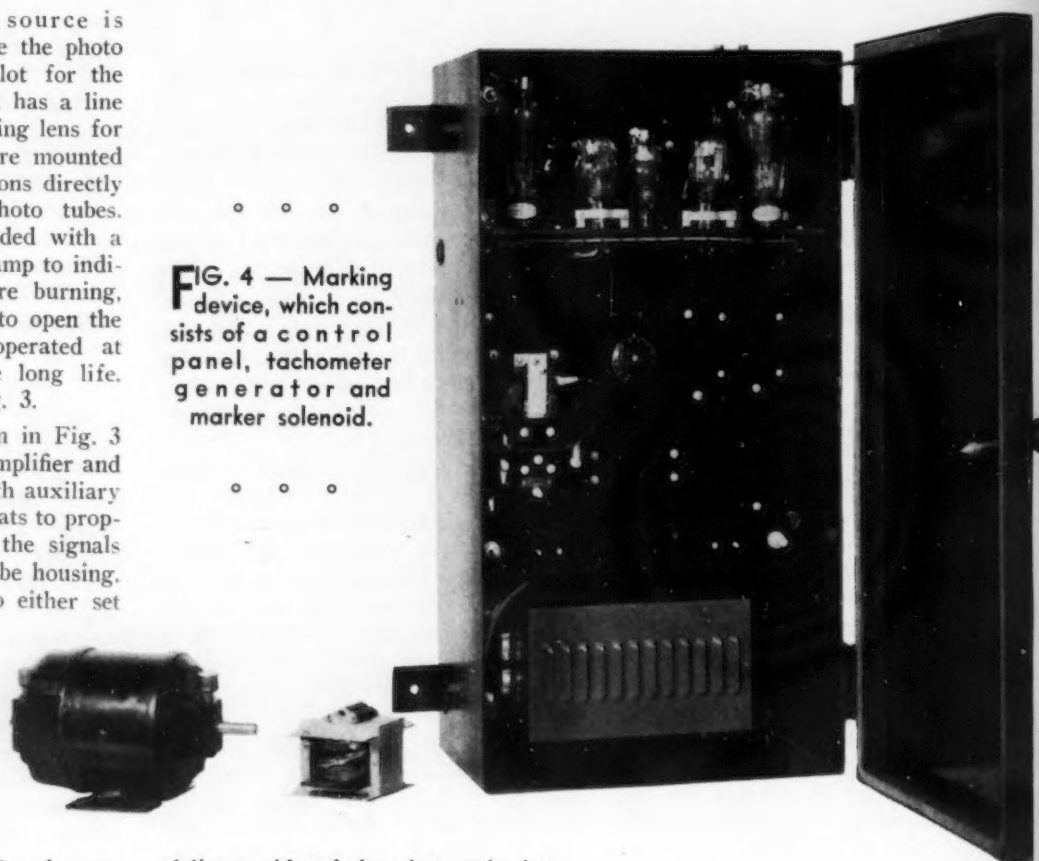
The marking solenoid is mounted adjacent to the light source on the delivery side.

The solenoid of the marking device is connected to some suitable mechanical marker usually supplied by the user and is mounted adjacent to the

mark is approximately constant regardless of the speed at which the strip is traveling.

When the hole detector operates with a classifier in a shearing line, the classifier must be equipped with a memory device since the hole detector is located at some distance from the classifier, as indicated in Fig. 1.

This memory device serves as a time delay to delay the operation of



**FIG. 4 — Marking device, which consists of a control panel, tachometer generator and marker solenoid.**

delivery side of the photo tube housing. The marking solenoid is energized and brings the marker in contact with the strip when it receives a suitable signal from the hole detector control panel. It is desired to have the mark about 15 in. long, and the standard marking device can be adjusted to give a mark from approximately 10 to 20 in. long, with the hole about in the middle of the mark.

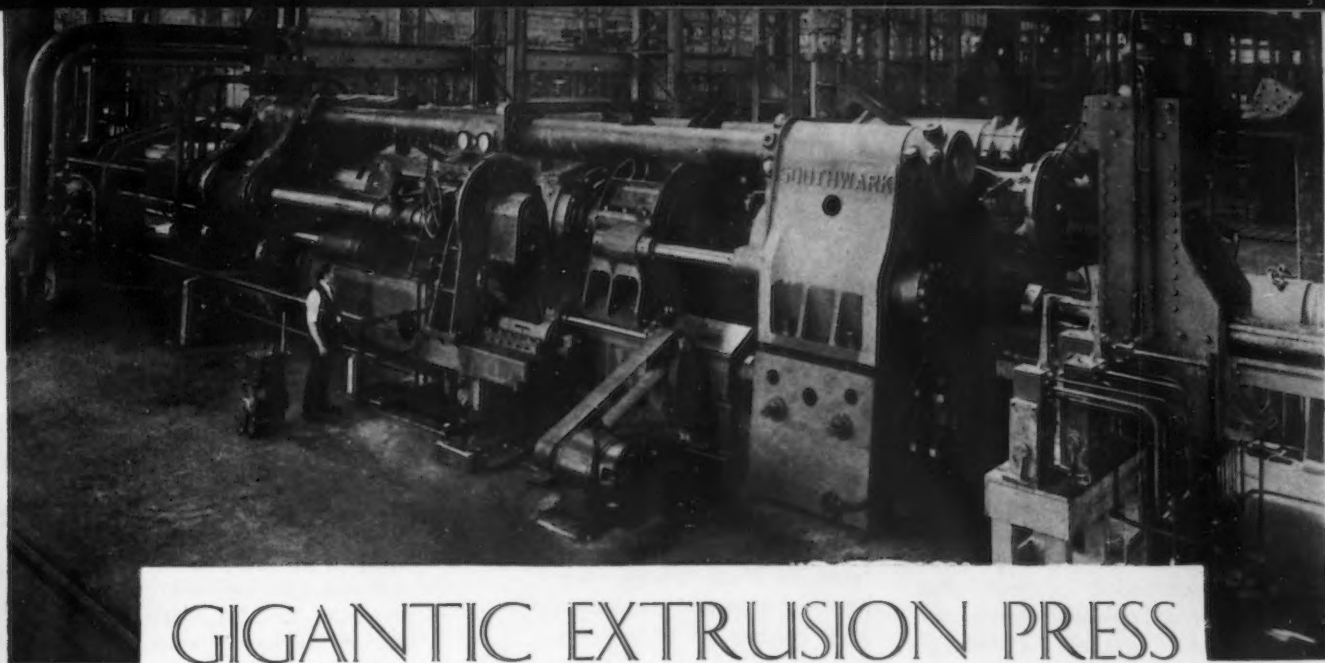
It is evident that the time that the solenoid must be energized to produce a mark of given length is inversely proportional to the speed at which the strip is traveling. To provide this feature, it is necessary to provide a speed indicating generator which is driven from the flying shear or other suitable device which produces a voltage proportional to the speed of the strip. This voltage is used on the control circuits and automatically adjusts the time that the solenoid is energized and thus the length of the

the gate of the classifier until the piece of steel with the hole in it reaches the classifier.

Several of these units have been installed during the last few months and have proved very efficient for detecting the holes in tin plate. One company at first suspected false operations when sheets were rejected that apparently contained no holes. However, careful inspection of the rejected sheet always revealed a small pin hole that could not easily be seen by the human eye. Experience indicates that a hole of 1/64 in. diameter is easily detected at any speed from 100 to 1000 ft. per min.

The use of machines of this type is expected to become general as another link in a long chain to insure the user of tin plate and other flat rolled products of a more uniform and dependable product.





## GIGANTIC EXTRUSION PRESS

WITH the development of aluminum and duralumin shapes for aircraft fuselage construction, in which many different hollow and solid shapes of intricate section are required, the extrusion process has come more and more to the foreground and forms a very important part of aircraft fabrication. As the application has expanded the range in size requirements has also increased, necessitating a steady increase in machine size and capacity.

Representing the largest built to date by the Baldwin-Southwark Corp., Eddystone, Pa., is an extrusion press just completed for export, which is shown in the accompanying illustration. It is capable of exerting a pressure of 4500 tons on the 59-in. diameter ram under 3200 lb. per sq. in. working pressure in the hydraulic system, and will handle aluminum, copper or other non-ferrous alloy billets up to 24 in. in diameter by 36 in. long. The working stroke is 7 ft. The machine proper weighs over 500 tons, and with all the auxiliaries, such as pumps and hydro-pneumatic accumulators, over 750 tons.

At the present time, extrusion pressures run up to 100,000 lb. per sq. in. and temperatures from 900 deg. F. for aluminum alloys (17S) up to 1300 deg. for brass. In order to maintain the heat in the billet during the extrusion operation, the containers into which billets are inserted must be supplied with heat to make up for losses due to transmission through the container walls, except for extremely rapid production where the mechanical heat of work becomes a factor. In the huge machine pictured, provision is made for heating by eddy currents induced

in the billet electrically. Gas heat also can be used.

The machine is of the four-rod type, with the forged tension rods 16 in. in diameter and weighing over 25,000 lb. apiece. Either direct or indirect extrusion may be performed. In direct extrusion, the container remains in a fixed position in front of the die and the extrusion ram pushes the billet through the die. Contact between ram and billet is through the medium of a dummy block that has a close running fit in the container shell so as to prevent the metal flashing back under the tremendous pressure. In the direct process, a substantial amount of power is lost in overcoming friction of the billet against the container wall since a hydrostatic pressure condition exists in the metal in its plastic state under a unit load well beyond its yield point.

In the indirect method, the relative positions of container and ram become reversed. The die is mounted on the end of a hollow ram, which remains stationary, and the container and billet are literally pushed forward over this ram by the action of the main hydraulic ram on the container. In this manner, friction of the billet against the sidewall is eliminated.

For hollow work, the mandrel around which the section is formed is in the form of a needle extending through the hollow extruding ram (direct method) and actuated by a separate pair of hydraulic cylinders, capable of exerting a total pressure of 450 tons in the large machine illustrated. The same mechanism can be used to operate a piercing plunger in preparing a solid billet for hollow work, and the pressure of the needle crosshead can be added to that of the main ram crosshead in extruding. All prin-

cipal parts of the machine are provided with adjusting means so as to produce concentric tubes within commercial limitations.

Not only the main ram, but also all the auxiliary motions are effected hydraulically in the 4500-ton machine. Movement of the container to and from the die head is effected by hydraulic rams, but this system is automatically unloaded when the indirect method of extrusion is employed. The die assembly sleeve is advanced into position hydraulically and the locking block behind the shoulder descends under hydraulic power. The guillotine billet shear is similarly actuated. This is used for severing the extruded rod or tube from the butt. The vise jaws for clamping the butt and stripping the rod are also operated by a hydraulic cylinder. The billet loading device is another such mechanism, as is the plunger on the runout table.

For certain classes of work, it is desirable to saw rather than shear the work to prevent work strains being set up at the ends of the piece and for this option two powerful coarse tooth saws are provided, driven by 40-hp. electric motors.

This press is operated from two 200 gal. per min., 3200-lb. multiple plunger hydraulic pumps in connection with a hydro-pneumatic accumulator system, employing low and high pressure bottles. The main ram is rapid traversed to the working position under a light pressure of 200 lb. The two high pressure accumulator containers are of Smith layer weld construction, measuring 4 ft. inside diameter by 30 ft. high, with wall 5 in. thick. They weigh 100,000 lb. each. Motors required to operate the machine total 900 hp.



# COMPACTNESS FEATURED IN NEW

**M**ANEUVERABILITY in congested spaces, such as freight cars, is emphasized in recently introduced industrial truck and tractor designs, which are narrow and of short wheelbase. This review of current announcements of the manufacturers also indicates that

more attention is being paid to the needs of the small shop. Two new portable types of shop cranes have been introduced, and portable designs of roller and belt conveyors have been put on the market in the past few months.

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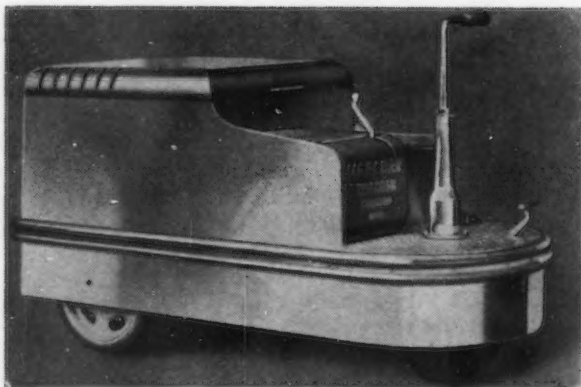
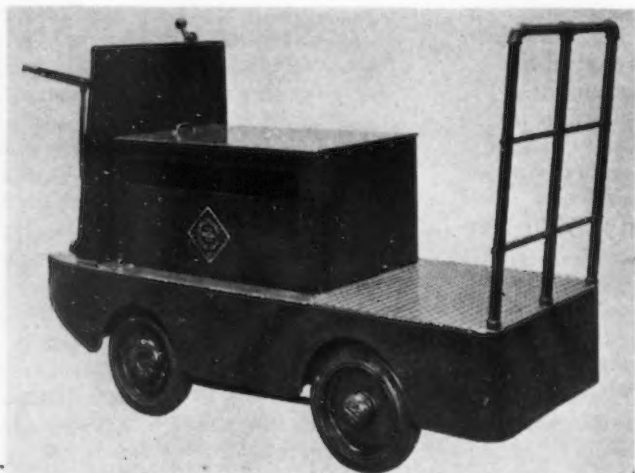
**I**N recent months a number of new designs of tractor units and fork trucks, powered both by storage battery and by gasoline engines, have been placed on the market. Not long ago the tendency was for each maker to outdo the other in matters of size and capacity, a natural result perhaps of designing for a specific need—the

handling of wide coil stock in the continuous strip mills that were springing up. The present tendency is in the reverse direction, and compactness and small size is emphasized.

**E**LWELL-PARKER'S type IE truck-tractor for example, has a rated capacity of 3000 lb. and a wheel-

base of only 37 in., with an overall length of 7 ft. Powered by battery, it has four speeds forward and four reverse. Platform is fitted with detachable end gate for additional load and provision is also made for pulling trailers. Frame is made up of heavy section formed plates welded into a one-piece construction, including the control pedal guard. Drive includes a free coasting, high efficiency worm and gear.

**A**NOTHER small electric tractor unit is the model A-560-3, only 32 in. in overall width, made by the Mercury Mfg. Co., Chicago. Normal drawbar pull is 500 lb., maximum, 1000 lb. Frame of the tractor is of channel iron, shrouded and streamlined by welded steel plates into an integral unit. A heavy rubber bumper runs around the entire body. Drive



UPPER LEFT

**T**YPICAL of the smaller sizes of industrial truck-tractor units now being made available is this Elwell-Parker type IE truck, rated at 300 lb. capacity and with 37 in. wheelbase.

ABOVE

**A**NOTHER compact model of short wheelbase (38 in.) is the Clark Stubby, a fork lift truck, capable of lifting pallet or skid loads 60. in. high.

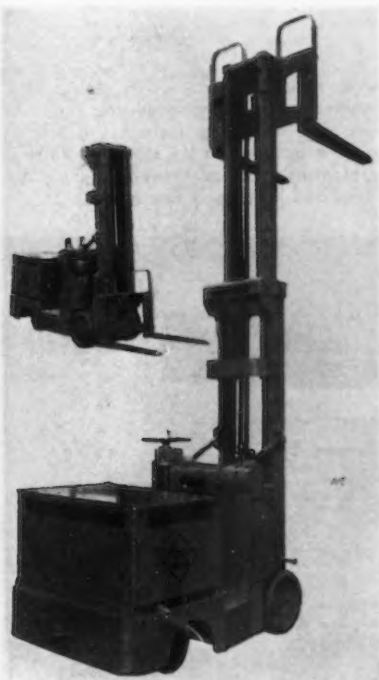
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**T**HE new Mercury streamlined electric tractor steers with a single wheel in front and has an overall width of only 32 in.

# MATERIAL HANDLING APPARATUS

axle is of the worm reduction type, with transverse semi-elliptic spring suspension. Steering is by single 15 x 3½ in. rubber tired wheel. A drum type controller provides three speeds forward and reverse.

**C**OMPACTNESS also characterizes the new power utility finger-lift truck made by *Clark Trutractor*, Battle Creek, Mich., for general purpose service around manufacturing plants. The Stubby truck, as it is called, is only 38 in. wide and has a wheelbase of 38 in. Although designed to handle standard skid equipment with 7, 12 and 18 in. underclearance, it will get hold of any load with as little as 2 in. underclearance and lift the bottom to 60 in. by means of a hydraulically actuated telescoping device. The rear coupling also enables the unit to be used as a towing tractor. Steering mechanism allows the truck to pivot on one wheel and thus make right angle turns. The Stubby is powered by a gasoline engine for continuous 24-hr. service. Speeds range from 1 to 7 m.p.h.



By FRANK J. OLIVER

Associate Editor, *The Iron Age*

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**F**ORK trucks with or without tilting and telescoping features in capacities of 2½ and 3 ton are now being offered by the *Atlas Car & Mfg. Co.*, Cleveland, powered either by storage battery or a Ready-Power gasoline unit. They have a wheelbase of 45 in. and overall width of 48 in. All four wheels steer. Drive is

through double reduction spur gears of the automotive type, and the hoist unit has a triple reduction spur gear drive, with two strands of roller chain for hoisting. The hoist carriage is mounted on roller bearing rollers. Semi-elliptic springs of highway truck type support frame on drive axle, which is positioned by radius bars to eliminate wabby steering. Driving wheels are mounted on Timken bearings and have ball thrust bearings for easy steering. Driving, hoist and tilting motors are *General Electric*, series wound, totally enclosed ball



ABOVE

**T**HIS special Baker gasoline powered industrial truck has a 32-cu. ft. dump body fabricated from copper bearing steel plate for handling ashes in a power plant. The body is held in the position shown by a latch, and when released it automatically dumps by gravity, the body being returned by spring tension when empty.

AT LEFT

**L**OCATING the operator's station amidship affords him an unobstructed view of the fork tips when the load is being picked up or placed with the Elwell-Parker model F-16 truck, rated at 6000 lb. capacity.

AT RIGHT

**A**TLAS model 3 ETF fork trucks are made with or without tilting and telescoping features. The size shown is rated at 6000 lb. capacity.





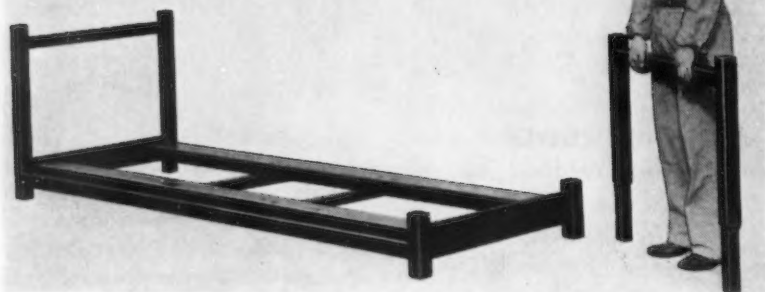
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**T**HE new Yale & Towne Rollaway jack and skid platform system is intended to put mechanical material handling within the economic reach of smaller plants.

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#### BELOW

**E**ITHER hand or electrical operation can be provided in a new line of portable shop cranes made in capacities from 500 to 5000 lb. by the Barrett-Cravens Co., 3255 West 30th Street, Chicago. Boom uprights can be made rigid, hinged or telescoping to negotiate low overhead clearances. Any lifting height desired is available. Cranes are mounted on roller bearing wheels to facilitate handling.



#### ABOVE

**A** STANDARD unit of the sectionalized work carriers devised by Mechanical Handling Systems, Inc.



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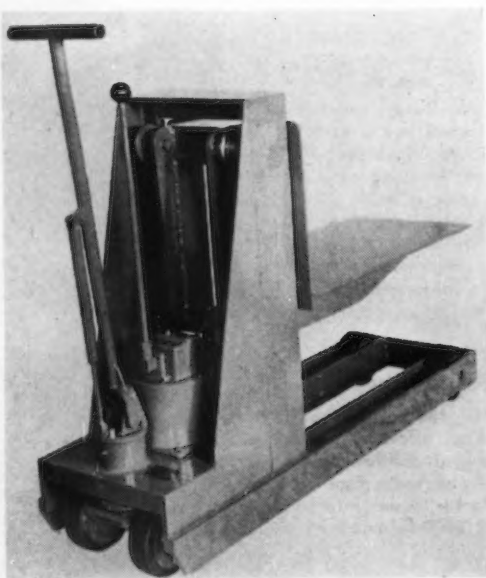
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#### BELOW

**F**ORD powered industrial locomotives built by the Brookville Locomotive Co., Brookville, Pa., have been extended in size and weight to include the new Ford 95-hp. V-8 engine in addition to the standard 85-hp. V-8 engine. The present line ranges in capacity from 2½ to 8 tons and is made in any gage.

#### ABOVE

**I**N the Bulldog combination barrel truck and automatic lifter, made by the Lansing Co., Lansing, Mich., a simple hydraulic pump lifts the barrel 28 in. in a few seconds, ready for draining. The truck is first firmly attached to the barrel to be handled by adjustable steel clamps. Wheels are of cast aluminum or molded rubber and aluminum shoes can be used on the legs to prevent sparking on the floor when handling inflammable liquids.

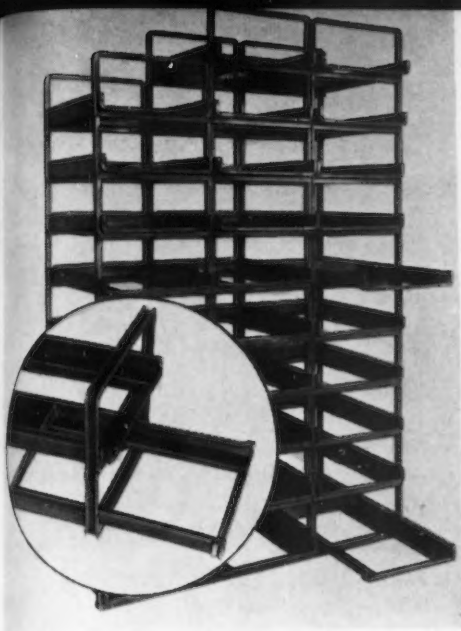


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**L**YON truck with hydraulic elevating table for maintaining skid loads of material at a convenient height. In addition to the fifth wheel steer, cantilever type shown, these trucks may be furnished in a toggle lever type, with or without a winch for handling dies or rolls.

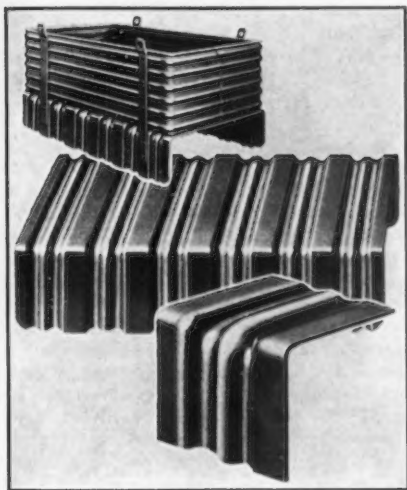






ABOVE

**H**ANDLING of the heaviest boxes is made easier by new roller bearing slides on Stackracks, interlocking units of channel and formed steel set up to form box storage racks of any height, size or capacity. Sliding motion of the box is restricted to half its length. A product of the Stackbin Corp., 66 Troy Street, Providence.



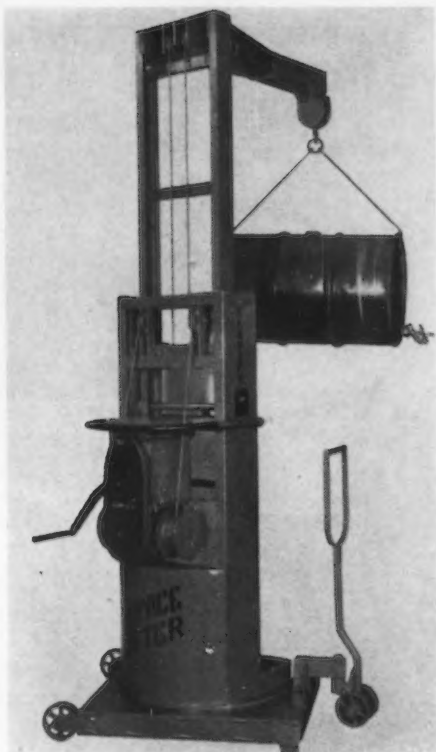
ABOVE

**S**TEEL lift truck platforms with double corrugations are now being made by the Union Metal Mfg. Co., Canton, Ohio. The patented corrugation consists of two half round recesses joined by a raised center rib which acts as a brace or gusset at the knee bends and as a bar brace on the deck and legs. The platforms are available in all the customary variations, including a complete line of steel corrugated platform boxes.

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AT RIGHT

**A**LL power operated stackers made by the Lewis-Shepard Sales Corp., Watertown, Mass., have a new type of operating control in which movement of the controller handle actuates the cable, exerting a straight up and down pull on it over a rolling contact. The control is mounted on both sides of the stacker for operator convenience. In hinged stackers, the control is self-adjusting, as the cable is automatically extended and taken up by a long spring within the handle.



AT LEFT

**T**ELESCOPIC features give a lowered height of 6 ft. 3 in. and a raised height of 10 ft. to a new portable turntable crane made by the Service Caster & Truck Co., 511 N. Brownwood Avenue, Albion, Mich. The entire crane mechanism revolves on a portable base, 36 in. square. Boom overhangs the center 36 in. and has a capacity of 1000 lb. Maximum travel of the hook is 8 ft. 8 in. Running gear is four metal wheels mounted on Hyatt bearings. This model is representative of many different types available.

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BELOW

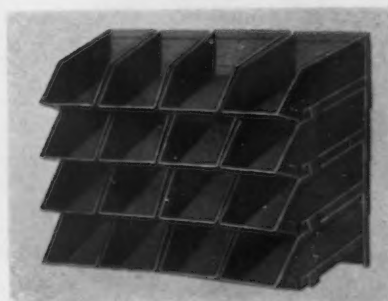
**S**PIN-A-BIN is the name given this revolving assembly of welded steel bins, made by Noggle Products Co., Ann Arbor, Mich. It is available in a unit containing 24 bins 3x3x2 1/2 in. or 24 bins each 4x4x3 in. Bins are 26 gage steel, finished in green. A double width bin can be substituted for any pair of single width bins.



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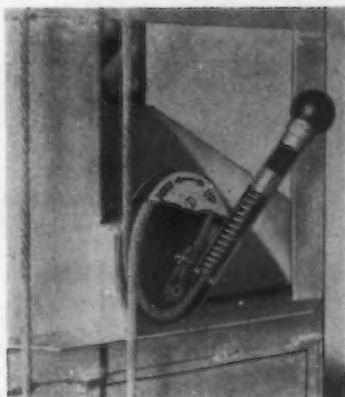
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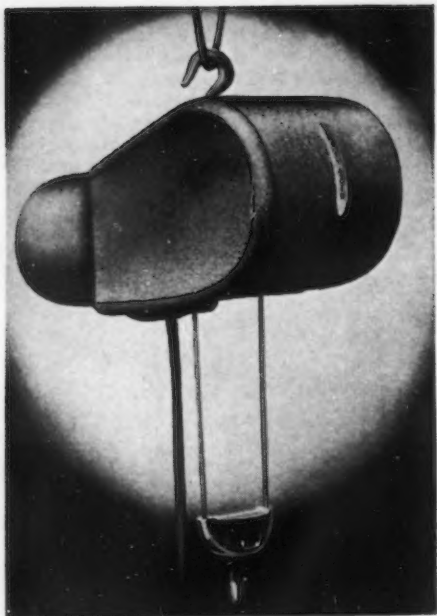
**A**NOTHER Stackbin product is this assembly bin made with a sloping floor which feeds the contents toward the front. The bins can be set in a semi-circle and can be stacked one above the other. Bins are 3 in. wide in front, 4 in. in back, and are 8 in. long and 2 1/2 in. deep. They are made of welded steel of heavy gage.



BELOW

**P**NEUMATIC tires and ball bearing disk wheels are used on the type E-4 hand truck recently developed by the Chicago Mfg. & Distributing Co., 1928 West 46th Street, Chicago. It is claimed that the operator can carry twice the usual load and that he will experience perfect balance of load at all times. The entire truck is fabricated of 12-gage steel and is welded throughout. Flat loading surface is 15 sq. ft., width of truck, 3 ft.; weight 215 lb.



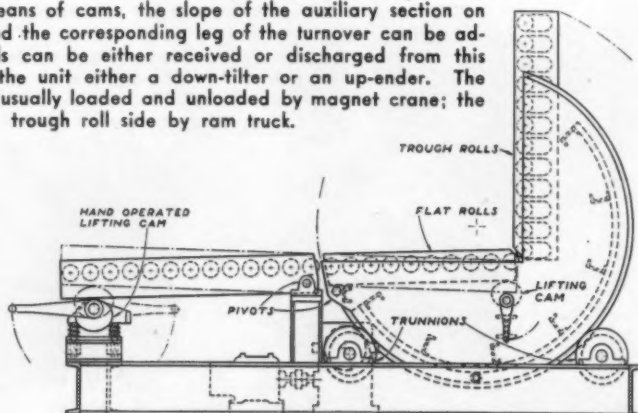


**T**HE Conco-Torpedo electric hoist is furnished for either trolley, hook or lug suspension and in capacities from 250 to 1000 lb.

bearing types. Drum type controllers are used for all movements.

**A**NOTHER new Elwell-Parker model is the F-16, a center control fork type rated at 6000 lb. It is built either as a telescoping or non-telescoping truck for inside car work or high tiering of pallet loads in a warehouse. Forks or rams of varying lengths can be supplied for either pallet work or handling coil stock. The new type of trail or rear axle on this unit carries the welded steel frame on a spring system that provides for three-point support so that all four wheels are always on the floor. The trail axle wheels are steered at sharp angles by a back geared handwheel, rotating the rear end of the truck about one or the other drive wheel.

**T**WO-WAY Turnover for steel coil handling, made by the Logan Co., Louisville. By means of cams, the slope of the auxiliary section on the flat roll side and the corresponding leg of the turnover can be adjusted so that coils can be either received or discharged from this side, thus making the unit either a down-tilter or an up-ender. The auxiliary section is usually loaded and unloaded by magnet crane; the trough roll side by ram truck.



Fork hoist is driven by double roller chain and is fitted with a slip clutch for protection against overloads, while an overrun ratchet device protects the hoist and chains if the forks are lowered against an obstruction. Regenerative braking is used when lowering loads from stacks. This truck may be fitted with interchangeable lead or alkaline batteries or gas-electric unit.

#### Battery Charging Standards

**A** NEW set of battery charging standards has recently been adopted by the Industrial Truck Sta-



**C**OFFING'S Quick-Lift electric hoist is a chain type made for either trolley or hook suspension. Supplied in 16 models ranging in capacity from 250 to 4000 lb. and from 1/3 to 1 hp.

tistical Association, 298 S. La Salle Street, Chicago, which represents the leading producers of electric industrial trucks, batteries and battery charging equipment. The purpose of the standards is to prolong the life of batteries by proper charging methods,

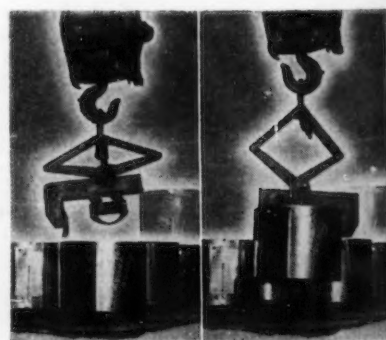
and the present revision brings up to date best practice for the automatic charging of lead-acid and nickel-alkaline batteries.

#### Sectionalized Work Carriers

**S**ECTIONALIZED work carriers of standardized dimension and construction, yet flexible in combination so that they may be used for storage and handling of almost any

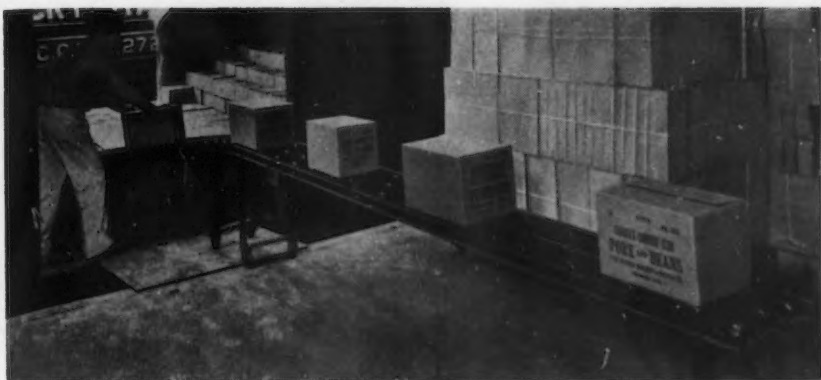


**E**NDURWELD chain is being fabricated in all standard types of sling chains by the American Chain & Cable Co., Inc., Bridgeport, Conn. Such chain is being electrically welded by a new technique in which the temperature of the weld and the pressure of the electrodes are automatically controlled. The weld is at the end of the link where it is protected from damage. Almost any material can be used, including steel up to 125,000 lb. per sq. in. tensile strength, stainless steel, monel metal or Everdur bronze.

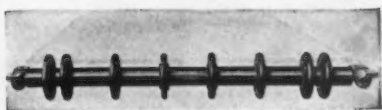


**D**ESIGNED to eliminate damage to the edges of thin steel strip during handling. These lifting tongs are made by the Heppenstall Co., Pittsburgh. At left the tongs are shown descending in the locked-open position. When the tongs come in contact with the coil, a release mechanism operates and the jaws grip the coil when the hook is raised as shown at the right. When the coil is deposited in a new location, tongs automatically release and lock in the open position.





**A** FLEXIBLE method of conveyerization, particularly applicable to the shipping room, is the Porta-Flow, made by the Alvey Ferguson Co., Cincinnati. Comes in sections 10 ft. long, weighing 68 lb. each. Integral ball bearing rollers are independently mounted either straight or staggered in sheet metal troughs. Steel angle upright supports are adjustable in height.



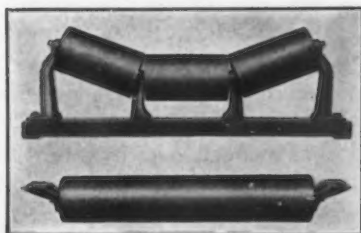
**R**OBINS Rubberdisc return idler is intended for use on any conveyor belt that handles abrasive, corrosive or sticky material. It is constructed of a ball bearing supported steel tube shaft on which is mounted a series of tough and resilient rubber disks, spaced about 6 in. apart, less at the ends. Since the belt is supported only at a few points, instead of its full width, the idler is self-cleaning and the flexing it gives the belt serves to clean the belt also. Made by the Robins Conveying Belt Co., New York.

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type of product, are announced by *Mechanical Handling Systems, Inc.*, 4700 Nancy St., Detroit. Priced to sell at low cost because of their standardized design, the carriers are made of arc welded square steel tubing for lightness but are sufficiently strong to carry loads up to 3000 lb. The basic unit consists of a 39 x 108-in. frame, with a 32-in. end frame at one end. The other end of the base has a short upright at each corner, each post being open at top and bottom so that a removable end frame, similar to the permanent one, can be slipped in to form a symmetrical carrier. Removable casters can be inserted under each upright to create a mobile unit, although generally these carriers are handled by fork truck or are placed on a flat trailer car.

The standard unit is provided with two 2 x 6-in. planks, running lengthwise, on which inexpensive dunnage can be installed. Side rails for bracing large parts carried on edge or hold down rails between the two end frames are easily attached. Floors and sides may be of either wood or metal. By

using dowel plugs in the top of each upright, carriers may be stacked to any height without danger of slipping. The units are also suitable for inter-factory shipment of parts, in which



**I**MPROVEMENTS in the Robins, Timken equipped troughing and return idlers include triple seals of cork, labyrinth and felt; one-shot lubricating system from a fitting at either end; and new types of malleable iron brackets designed to prevent material lodging between brackets and pulleys. Pulleys can be furnished in cast iron or steel, either 5 or 6 in. in diameter.

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event one truck or freight car is sufficient to carry nested all the carriers which occupied five trucks or cars when loaded.

#### AT RIGHT

**A**IRCRAFT tubing is welded into an integral truss of great strength and light weight to form the frame of this portable conveyor, especially designed for brickyard use by the Stout Engineering Laboratories, Dearborn, Mich. With slight alterations it can be suited to conveyance of any type of material. As shown its capacity is 300 lb. at 40 ft. per min., using a 6-in. fabric belt.



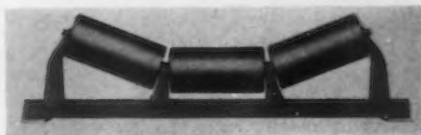
#### Hardwood Skid Platform Tops

**B**Y scientifically controlling conditioning of all lumber used in floor truck tops so that the average moisture content does not exceed 11 per cent, shrinking, cracking and splitting of the boards are reduced to a minimum. Maple, beech and birch stock used by the *Lewis-Shepard Sales Corp.*, Watertown, Mass., in the manufacture of its Weldmaster skid platforms and its Floormaster trucks is now so treated. Formerly air drying over a period of three to six months reduced the moisture content to 14 per cent. Now the moisture is brought down to 10 per cent or less in conditioned drying chambers. Moisture pickup after conditioning is about 1 per cent.

#### Lift Truck With Hydraulic Table Elevator

**F**OR maintaining skid loads of materials or parts at convenient heights for machine operators or assemblers, the *Lyon Iron Works*, Greene, N. Y., is building a new line of hand trucks with hydraulic elevating tables of cantilever type. They may also be furnished in a toggle lever type, with or without a winch

(CONCLUDED ON PAGE 83)



**S**ERIES 43 belt idlers, newly introduced by the C. O. Bartlett & Snow Co., Cleveland, have self-cleaning bases. Slotted holes are provided in the mounting plates to permit making of any slight adjustments in aligning the belt. Labyrinth grease seals are used to protect the anti-friction bearings and a through grease tube is provided from one bearing to the other. The idler rolls are pressed onto the shoulders of the cast roll ends, the outer ends of which are rounded to prevent injury to the belt.



# ELECTRO-PLATERS MEET

**T**WENTY-SEVENTH annual meeting featured papers by foreign contributors. The program included technical and practical discussions of adhesion, current distribution, testing methods, electroplating equipment and processes, addition agents, and plating practice in England and France.

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**T**HE twenty-seventh annual convention of the American Electro-Platers Society and the second international conference on electro deposition was held June 19 to 22 in Asbury Park, N. J., with headquarters at the Berkeley-Carteret Hotel. This convention, which was managed by the Newark branch of the American Electro-Platers Society, also celebrated the one-hundredth anniversary of the birth of commercial electroplating. A total of over 600 members and guests registered for the convention, showing the keen interest of American industry in the proceedings of this Society and the close attention with which it is followed by American metal products manufacturers from coast to coast.

The outstanding feature of the program was the contribution of papers by English, French and Canadian electro-metallurgists. Several of these foreign papers were read by the authors in person, while others were presented by electrical transcription. The records had been made abroad and sent to this country in time to be presented at the education sessions.

Another of the features of the convention was an exhibit of plated ware of all kinds, contributed by members of every branch of the Society.

## Technical Sessions

The first technical session was held on Monday afternoon, June 19, presided over by C. H. Proctor, founder of the society, who opened the meeting with a few reminiscences of boyhood experiences as a factory hand in Birmingham, England. The first pa-

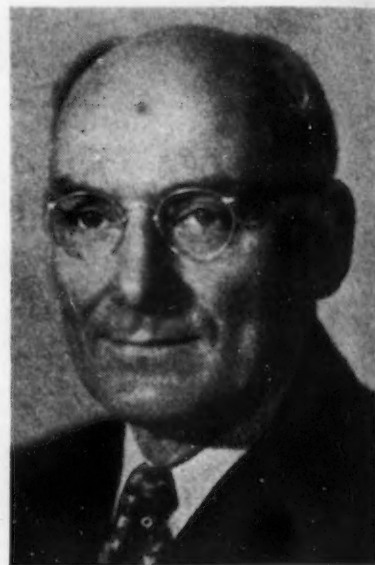
per presented was "Notes on Adhesion of Electro-Plate Coatings," by A. W. Hothersall, director of electro-plating research, Woolwich Arsenal, London, England, and president of the electro-depositors technical society of England.

Mr. Hothersall discussed the fundamental reasons why electro-deposits adhere to basis metals and also described the process for anodic etching in sulphuric acid to improve the adherence of nickel to steel. He showed slides giving figures for the order of adhesion obtainable with nickel on various metals. The figures, representing the tensile strength of the bond between the deposit and basis metals, varied from 5.1 tons per sq. in. for nickel on aluminum to 32.1 tons per sq. in. for nickel on nickel steel forgings.

It was pointed out, however, that similar degrees of adherence could be expected from electro-deposits on sheet steel since the specimens tested were necessarily cylindrical for ease in handling in the testing machine. These figures showed conclusively that in properly applied electroplates there is a strength of adherence far beyond what has been popularly conjectured.

Mr. Hothersall suggested that the forces holding together the electro-deposit and basis metal are of atomic origin. It is generally known that the electro-deposit often continues the structure of basis metal, thus to some degree building up a continuous structure. This is clearly evident in deposits of copper on copper, nickel on nickel silver and even in copper on nickel on annealed iron. The heavy copper, separated from the annealed iron by a thin coat of nickel, still tends to follow the structure of the annealed iron.

Mr. Hothersall explained some of the reasons for the lack of adhesion of some electro-deposits. Even when the basis metal is perfectly clean, the deposit will not adhere if the surface of the steel is mechanically weak. The stripped plate will have a layer of steel on the back, proving that the adhesion between the steel and the nickel is high, but that the weakness



**R. M. GOODSELL**  
President, American Electro-Platers Society

resides in the surface of the steel itself. Such weakness can be caused by mechanical treatment applied to the steel; for example, machining will cause minute cracks; polishing will create an amorphous film which will weaken adhesion. Another important cause of poor adhesion is the deposition of hydrogen on the work, a common occurrence.

The surface condition of basis metal can be greatly improved by etching in sulphuric acid solution. The amount of etching required varies with the type of work. For example, polished steel requires little etching; machined steel requires considerable etching.

Mr. Hothersall recommended anodic etching in sulphuric solution, about 75 per cent by weight, as an aid in practical decorative nickel plating operations. For industrial nickel plating in heavy coats, 30 per cent sulphuric acid by weight, is recommended, at a temperature of about 75 to 80 deg. F. The weaker solution results in a rougher deposit which, however, is not objectionable for industrial work.

C. E. Gardam, research chemist, Woolwich Arsenal, England, presented

# AT ASBURY PARK ♦ ♦ ♦



**FREDERICK FULFORTH**

First Vice-President, American Electro-Platers Society

a paper (by electrical transcription), on "The Distribution of Cup-Shaped Articles." He presented data proving that the deposit on such articles varied widely, the heaviest deposit forming nearest the anodes and the lightest, farthest away. In the tests described, it was shown that the average deposit was only one-fourth the thickness of heaviest deposit. In other words, if an average deposit of 0.0005 in. was required, it was necessary to deposit 0.002 in. on the nearest points. Cobalt-nickel deposit showed even wider variation. The variation could be reduced by increasing distance between anodes and the work up to the limit of practical operations. Improvement might also be effected by placing anodes in the recesses of the work.

C. F. Francis-Carter, manager of the plating department, Serk Radiators, Ltd., London, England, read a paper (by electrical transcription), on "Recent Developments in British Plating Practice." He stated that bright nickel plating is making important strides. Rochelle salt-copper cyanide solutions are growing in popularity. Considerable interest has been evinced in tin plating using a sodium

stannate solution. Much work is being done in heavy nickel deposits for industrial purposes and also in heavy chromium for military equipment. Vapor degreasing has made a firm place for itself in the cleaning operations.

Plant development has been largely along lines of improved equipment such as full automatic plating machines, rubber lined tanks, heating of solution in heat exchangers rather than by steam coils and immersion heaters, improved filtration, etc. The use of copper-oxide rectifiers has grown to a total of 750,000 amp., mostly at 6 volts.

There is a strong trend toward specifications for electroplates, designating thickness of coating and method of testing. There is also an important movement toward better process control.

Dr. S. G. Clark, research chemist, Woolwich Arsenal, London, England, presented a paper on "Chemical Methods for Testing the Thickness of Metallic Coatings." The author described in detail the B. N. F. jet test, for determining the thickness of coats, giving the solutions used for various plates. He pointed out that the apparatus, while simple in construction, requires a definite speed of corrosive liquid delivered to article being tested and a definite shape of the nozzle through which the liquid flows. Correction factors are necessary for different plates, such as bright nickel deposited from sulphonated solution.

Dr. A. Gerrilot, electro-chemical engineer, Sorbonne, Paris, France, presented a paper (read by Dr. Blum) on "Chromium Plated Wire," in which he described the method of depositing chromium on fine copper or brass wire to be used for braid. The wire is drawn from spools through a cleaner consisting of a dilute solution of nitric acid (one part in ten thousand), then through a rinse, then through the chromium plating tank, rinse, etc. The chromium solution contains 40 oz. per gal. of chromium acid, plus addition agents. It operates at 160 amp. per sq. ft. or about 90 milli-amp. per ft. of wire in the bath. Air agitation is used. In one instal-

lation, six such units in parallel are fed from one reservoir of chromium solution.

The chromium deposited directly on brass or copper is bright and shows good adherence.

At the Tuesday morning session, John Acheson, president of the Toronto Branch of the Society, presided. Dr. J. T. Burt-Gerrans, Toronto University, Toronto, Canada, spoke on the "Role of Diffusion in Electroplating Processes," and Dr. J. U. MacEwan, professor of metallurgy, McGill University, Montreal, Canada, described "The Theoretical Training for the Electroplating Industry."

A paper, "The Electro Déposition of Black Molybdenum Finishes," by R. A. Hoffman and R. O. Hull, E. I. du Pont de Nemours & Co., Cleveland, Ohio, was delivered by Mr. Hull. He described a new solution consisting of ammonium molybdate,  $4\frac{1}{2}$  oz. and nickel sulphate,  $3\frac{1}{2}$  oz., with some boric acid, which produces a black lustrous finish on zinc and zinc-base alloys, cadmium plated parts and also on aluminum. It has a very high throwing power, giving uniform thicknesses of deposit.

The solution is operated at a temperature of 160 to 170 deg. F.; pH, 4.3 to 5.; current density 2 to 5 amp. per sq. ft. The rate of deposition is very high, up to 0.001 in. in 10 min. Rubber lined tanks are recommended although lead linings can be used. Work rod agitation is desirable but not indispensable. Insoluble anodes are used.

It is noteworthy that higher current densities give a lower rate of deposition. At the normal operating rate, 5 amp. per sq. ft., 2 gm. per amp. hr. is deposited.

The deposit consists of about 45 per cent molybdenum, 10 per cent nickel and the balance oxygen. It has a low density, about the same as water.

In practical operations the deposit is limited to about 0.001 in. in thickness with the maximum at 0.002 in. Above this thickness, deposition ceases and evolution of hydrogen at the work is noticeable. As the thickness of deposit increases, the rate of depo-



sition decreases. Some deposit can be obtained on zinc by immersion without current, but it is very thin and poor in quality. The coating has a deep black lustrous appearance, and due to the high throwing power of the solution, it is suitable for the inner surface of tubes.

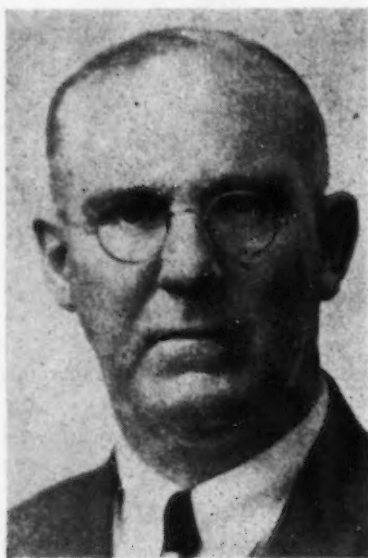
The coat will flake off under sufficient compression but not under tension. On zinc, it has withstood 150 hr. in the salt spray. On iron it shows rust quickly. It can, however, be protected by lacquer. This type of finish is intended primarily to replace black nickel and similar coats. It is essentially decorative in character.

Burton G. Daw, president of La Salco, Inc., St. Louis, spoke on "The Ampere Hour Meter." He described and explained the various applications of this instrument for recording the quantity of current used. Comparing it to the speedometer of an automobile, which records the number of miles traveled, the ampere hour meter can be used to tell when it is time to adjust solution; that is, when a number of ampere hours "have been traveled."

R. O. Hull, E. I. du Pont de Nemours & Co., Cleveland, spoke on "Current Density Range Characteristics—Their Determination and Application." He described a simple testing set for determining the optimum current densities for various solutions. By means of this set, a simple reproducible plating test can be run at frequent intervals to check the condition of the solution. It is especially useful for testing small volumes of solution before and after making additions to the production bath. The set consists of a small, narrow one-quart cell with an inclined cathode placed so that the current density is high at the near end and low at the far end. Plating in this solution at a specific current input and for a definite length of time gives a deposit of varying quality and thickness over the cathode from which, by measurement of the current density at specific points, a calculation can be made for optimum current density to be used in the commercial plating tank.

At the session held Tuesday afternoon, Charles C. Conley, president of the Dayton Branch of the Society, presided.

The first speaker, Dr. D. A. Cotton, director of research, Delco-Remy Division, General Motors Corp., Anderson, Ind., described the methods in use at their plant for chromium plating tools, dies and gages to heavy thick-



JOSEPH L. DOWNES  
Second Vice-President, American Electro-Platers Society

nesses, for engineering purposes. Little or no chipping or peeling of the plate is in evidence on their products, even in plating shears on which the chromium has to stand the impact of shearing armature laminations. To a considerable extent the quality of work depends upon the skill of and experience of operators.

In answer to questions from the floor, Dr. Cotton stated that for stripping they use hydrochloric acid. Most of their work is done at from 4 to 7 volts and at high current densities, 360 to 1000 amp. per sq. ft.

In replating chromium plated parts, without stripping, it is advisable to warm up the part to almost the temperature of bath before plating; then to put the work on reverse current for about 15 or 20 sec.; to start plating at low current density (about 200 amp. per sq. ft.), and then to raise the current density gradually to the full volume.

"The Anodic Coating of Aluminum" was described by Dr. Junius D. Edwards, assistant director of research, Aluminum Co. of America, New Kensington, Pa. Dr. Edwards briefly traced the history of this process which has assumed considerable commercial importance for both decorative and protective coating.

"The Application of X-ray Diffraction to Electro Plating Problems" was discussed by Herbert R. Isenberger, St. John's X-Ray Service, Inc., Long Island City, N. Y.

"Bright Dips for Non-Ferrous Metals" were described by Dr. W. R. Meyer, Editor of *Metal Industry*, New York. The author listed the various combinations of chemical dips suitable for cleaning, decorating and "polishing" such metals. He pointed out that a bright dip should remove scale as well as brighten surface of metal. It must attack metal uniformly and must be easily and thoroughly rinsable.

One type of dip was given in some detail. For bright dipping nickel or nickel plate, the work is made the anode in a 70 per cent sulphuric acid solution at 100 to 125 deg. F., at 280 to 550 amp. per sq. ft., and at 8 to 10 volts. The work remains in the dip from 10 to 25 sec. Anodic etching (sometimes called "chemical polishing" or "smoothing") is suitable for brightening irregularly shaped articles which are difficult to polish. Other anodic dips mentioned were orthophosphoric acid and perchlorates.

F. P. MacFarlane, University of Cincinnati, Cincinnati, presented a paper on "A Study of Nickel Anode Corrosion and Loose Nickel Phenomena."

#### Educational Session

The educational session held on Tuesday afternoon was presided over by Joseph Underwood, president of the Philadelphia branch of the Society.

Frederick Fulforth, of the Proctor Electric Co., Philadelphia, presented a motion picture showing the methods of production of the No. 3 finished steel as practised by the Newman Crosby Steel Corp. This type of steel has a specially high finish, most suitable for subsequent plating operations. Its outstanding features are its finish, temper, grain size, papering and boxing.

Guerin Todd, chief engineer of the Hanson-Van Winkle-Munning Co., spoke on "The Modern Generator and Rectifier." Mr. Todd traced the history of the electroplating generator from its inception to the present time, giving its outstanding features and characteristics.

Other papers read at this session were, "A Study of Electrolyte Films," by Dr. A. Kenneth Graham, consulting engineer, A. Kenneth Graham and Associates, Jenkintown, Pa., and Dr. Harold J. Read, instructor in electrochemistry, University of Pennsylvania, Philadelphia, and "Time Pieces—From Sun Dial to Wrist Watches," by L. A. Critchfield, Hamilton Watch Co., Lancaster, Pa.

At the session held on Wednesday



afternoon, James W. Hanlon, president of the Chicago branch, presided.

Dr. Frank C. Mathers, professor of electrochemistry, University of Indiana, Bloomington, Ind., delivered a paper on "Addition Agents in Electro Plating Processes." He discussed the effects of a number of addition agents on solutions of various compositions for depositing lead, antimony, tin, bismuth, etc., especially those baths containing halogens. No general rules could be drawn from the work done as each metal deposited and each addition agent seemed to be a law unto itself.

"A Review of Finishing Methods" was presented by Dr. Gustave Klinkenstein, vice-president and technical director of Maar & Waldstein Co., Newark, N. J. The author described the advantages and disadvantages of the various methods of applying lacquers, enamels, synthetics, varnishes and other organic coatings by brush, roller coating, centrifuging, tumbling and spraying. The factors which influence the choice of methods are the quality of coating required, the character of the film, the size, shape and weight of the product, the volume of production, methods of material handling available in the plant and the type of labor available.

Brushing is used for small lot jobs, although it can be applied mechanically where the product lends itself to suitable jigs and fixtures. Roller coating is best suited to flat surfaces, giving uniform thickness of coats and small wastage of material. It can also be used on tubular products. Tumbling consists of rolling for 15 to 30 min. in a revolving barrel with a small quantity of finishing material which is poured or sprayed in during the tumbling operations. It is good for small light articles which do not nest; also for hollow balls. The films are thin but successive coats may be applied.

Centrifuging is economical for mass production of small parts, giving an even and durable coat. It may also be applied to large parts like automobile wheels, treated singly. Hand dipping, the oldest method of coating, is satisfactory for small quantities or special jobs. The disadvantage of this method, it was pointed out, is the use of open tanks which involve contamination, solvent evaporation, lack of uniformity of coating and fire hazard. A high degree of skill of the operator is necessary.

Mechanical dipping is widely used. The machines can be designed to handle quantities varying from small lots



WILLIAM J. R. KENNEDY  
Executive Secretary, American Electro-Platers Society

to large production runs. An interesting variation of the dipping machine has been recently introduced in which the tank holding the lacquer is raised to engulf the pieces to be finished and then lowered to free them, instead of raising and lowering the articles themselves.

Gasket coating is a special form of treatment used for long articles of uniform cross section, like pencils. The pieces are dipped and then pressed through a gasket of rubber or felt, which removes the excess finish. Multiple coats can be applied.

Probably over 75 per cent of all finishing work is by spray, either hand or machine. This method may be applied to any object in any quantity, using any finishing material and to produce any designs or number of colors. Certain finishes, like wrinkles, suèdes, veil effects, etc., can be applied only by spraying. The disadvantages are the risk of poor uniformity of coating, lack of economy in some instances, and waste of finishing material. An interesting device to provide uniform colors is the circulated paint system which feeds the finishing material from a central tank to each of the spray booths and guns.

A very recent development is hot lacquer applied at 150 to 160 deg. F. by means of special spray guns, through which the lacquer recirculates without cooling. The heat reduces the viscosity of the lacquer making possible thicker films and re-

ducing finishing time. Lacquer applied hot, it is stated, combines many of the advantages of both synthetic finishes and lacquer, such as quick drying and brilliant colors.

Flow coating is very little used except in special instances where the work is of such character that it is difficult to handle by the standard methods.

A paper on "Agitation" was read by Donald Wood, Reed & Barton, Taunton, Mass., which aroused a great deal of animated discussion, as the problem is of considerable importance in practical plating operations. Mr. Wood described the difficulties encountered in improving deposits by agitation which is in many cases effective in reducing cathode polarization, thus permitting the use of higher current densities for faster deposition. Violent agitation results in poorer deposits, gentle stirring being preferable.

Dr. Graham, in the discussion, pointed out that agitation was necessary also to overcome the horizontal stratification of solution, the differences in densities between the upper and lower parts of the tank. Professor E. M. Baker recommended moving the cathode as the most practical method of agitation to bring the depleted cathode film into more concentrated solution.

Frank C. Mesle, Oneida, Ltd., Oneida, Canada, spoke on "The Adhesion of Electro Deposits." This property is of such importance that specifications should be developed for it and also standard methods of testing. Mr. Mesle described and illustrated some of the simple practical testing methods he had developed in his own work. He also pointed out that low temperature heating of articles after plating often improved the adherence of the deposit; at the same time it revealed poor adherence or the existence of imperfect coats through blisters, peeling, etc. The prerequisites for coat adherence are cleanliness of the article and a good finish on the surface which, he stated, gives better plates than etched or emiered surfaces. Heating to 350 deg. F. for 10 min. in many cases arrested peeling of deposit.

Mr. Hothersall in his discussion pointed out the danger of heating plated articles when the coefficient of expansion between the basis metal and plate were dissimilar. Heating in such cases should be slow in order to avoid rupture of plate.

A paper on "Practical Suggestions" (CONCLUDED ON PAGE 62)



**S**CENES like this from the 1935 Machine Tool Show will be duplicated many times over when thousands of executives from every branch of the metal working industries flock to Cleveland in October for the 1939 exhibit. Machines will take  $6\frac{1}{2}$  acres of display space, every available square foot of Cleveland's mammoth Public Auditorium.

## MACHINE TOOL SHOW—CLEVELAND

**A** MACHINE Tool Show of greater magnitude and likely to evoke more interest than ever before is being announced to the public this week by the National Machine Tool Builders' Association.

Both in number and range of exhibits and in improved performance and design of machine tools, this year's show, which will be held Oct. 4 to 13 in Cleveland, is expected to set a new high mark for the industry and furnish wider appreciation of its important contribution to the national welfare.

As in 1935, the show will be housed in Cleveland's \$15,000,000 Public Auditorium, which contains over six acres of exhibition floors. Of this space, 150,000 sq. ft. will be taken up by the actual booths of exhibitors, ranging in size from 200 to 4000 sq. ft.

Eighty-five per cent of the exhibit space will be devoted exclusively to the showing of machine tools, most of them offering more production, greater precision, safety and ease of control. The balance of the space will contain displays of makers of machine tool accessories, and of publishers of magazines covering the machine tool field.

The ground work has progressed

rapidly following the call for reservations. All of the available exhibit space has been over-subscribed for some weeks, and original requests for space had to be cut in order to hold the total booth space within available limits.

To provide the power required to operate the many machines upon the exhibit floors, special power lines will be installed carrying an 8500-hp. connected load.

Admission will be by registration, with registration fee of \$1 per person.

Past exhibitions held at Cleveland have brought tremendous enthusiasm from visitors and exhibitors. Machine tool users were provided inspiration and the capital goods industries received stimulation. Admissions on one day alone during the 1935 show totaled 27,000.

"The purpose of this show is to place under one roof, for convenient inspection and study, the finest and most modern machine tool equipment from every branch of the machine tool industry," says Wendell E. Whipp, president of the National Machine Tool Builders' Association and presi-

dent of the Monarch Machine Tool Co., Sidney, Ohio. "The last four years have shown substantial advances in the art of machine tool building—advances which mean reduced production costs, increased productivity per dollar invested, and greater potential profits.

"The visiting manufacturer will have ample opportunity to watch various machines in operation, to ask questions, and to determine just what tools will be most effective in solving his particular production problems.

"This year's show is purely a business proposition. Registration fee is charged mainly to insure that attendance will be confined to people who have a direct dollars-and-cents interest in better machine tool equipment. Rules governing displays have been worked out with a view toward maximum visibility and a minimum of crowding."

In connection with the Machine Tool Show there will be held a series of evening meetings sponsored by the Machine Tool Congress, which will be open to the people attending the show. Organizations participating in the Machine Tool Congress are the Ameri-





**W**ENDELL E. WHIPP, president, the National Machine Tool Builders' Association, and president, the Monarch Machine Tool Co., Sidney, Ohio.

ND OCT. 4 TO 13 ♦ ♦ ♦

can Foundrymen's Association, Inc., American Society of Mechanical Engineers, American Society of Tool Engineers, Associated Machine Tool Dealers,

Cleveland Engineering Society, National Electrical Manufacturers' Association, National Foremen's Association, National Machine Tool Builders'

Association, and Society of Automotive Engineers. Speakers at these meetings will include outstanding industrialists and engineers.

## **Ampco Metal Celebrates Its 25th Anniversary**

**M**ILWAUKEE—Several hundred persons were guests of Ampco Metal, Inc., Milwaukee, on Friday and Saturday last week, when the company celebrated its 25th anniversary with an open house. In 25 years this company has grown from a plant of 2500 sq. ft. to its present size of 60,000 sq. ft. and employs about 115 persons as against four originally.

On June 10, 1914, the American Metal Products Co. was founded in Milwaukee for the production of an aluminum bronze, called "Ampco," the name being derived from the company's initials. At that time aluminum bronze was practically unknown, and the idea of making such an alloy, containing a goodly percentage of aluminum and iron, considering knowledge at that time, was deemed foolhardy.

The alloy had several outstanding characteristics, however, among which was its ability to be produced with an as-cast Brinell hardness of as high as 350. Little or no market existed at that time and the production of satisfactory castings was a laborious process.

Today, Ampco has 1200 active national and international accounts. It produces not only the original but improved Ampco metal, but also specializes in the production of aluminum bronze and other bronze alloys, including beryllium copper, high-conductivity welding alloys, under General Electric and P. R. Mallory Co. patents, and alloys made to private and Federal specifications.

The specialty of the company today is the production of sand and centrif-

ugal castings for general use, as well as for the machine tool and aviation industries, but its products are available also in rolled, forged and extruded forms.

Probably the most interesting, and certainly the most modern, division of Ampco is the centrifugal casting division for the production of aircraft propeller hub bushings, gear blanks, and other specially-shaped parts. The centrifugal casting weight range extends from a few ounces to over three tons.

C. J. Zaiser, president and general manager, reports current business well ahead of the 1929 boom level, and says that sales prospects reports from the 19 district offices indicate optimism in spite of the generally unsatisfactory conditions over the country at large.



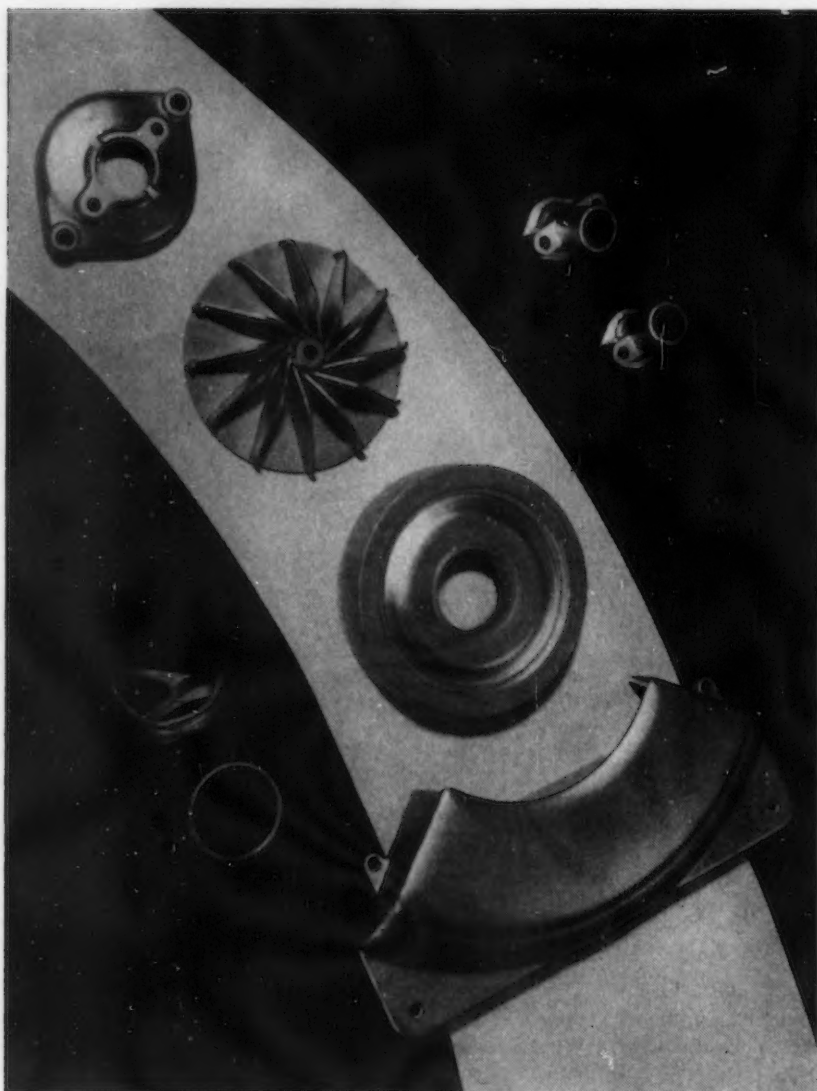


Photo by Dow Chemical Co.

## MISCELLANEOUS Dowmetal die castings.

**T**RANSPORTATION, in one branch or another, which is perhaps responsible for more metallurgical developments than any other single industry, may also be credited with the greatest influence in stimulating the development of magnesium from a specialty to a structural metal.

Magnesium has one physical property of primary interest to industry—its amazingly light weight. This is so extraordinary as to overshadow its other qualities. Its specific gravity is 1.74 about 30 per cent less than aluminum. So, for aircraft, automotive applications and many moving parts, this metal holds great attraction. The use of magnesium eliminates "dead weight," reduces power requirements and increases the pay load.

Through this one outstanding quality, magnesium has become one of our

important structural metals. In 1936 about 1,000,000 lb. of magnesium alloy structural products (castings, sheet, structural shapes, rods, tubes, forgings, etc.) were manufactured. In 1937 these products accounted for over 1,400,000 lb. in a total magnesium production of more than 4,500,000 lb.

The previous history of magnesium can be told in a few words. First produced in France in 1830, it was for many years nothing more than a very expensive curiosity. In time it became an important factor in pyrotechnics, then in the manufacture of organic chemicals, then as a scavenger and deoxidizer in casting nickel, copper, zinc and aluminum alloys, and later as a minor but important constituent in aluminum and zinc-base alloys. In the early 1900's commercial production of primary

# MAGNESIUM

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By **ADOLPH BREGMAN**  
Consulting Engineer, New York

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magnesium was begun in Germany. Since 1915 America has produced this material in metal and alloy form in steadily growing amounts to the total noted above.

In addition to light weight, the physical properties of the magnesium alloys used for structural purposes are important inasmuch as they compare so well with those of other metals used for similar purposes. Sand castings of the composition aluminum 6, zinc 3, manganese 0.2, the balance magnesium, have a tensile strength of from 27,000 lb. per sq. in. as cast, to 38,000 lb. per sq. in., as heat treated and aged, and a Brinell hardness of 50 to 62. Permanent mold castings of the alloy aluminum 10, manganese 0.1, the balance magnesium, run from 22,000 to 34,000 lb. per sq. in. and from 52 to 69 in Brinell hardness. The die casting alloy, aluminum 9, manganese 0.13, zinc 0.6, the balance magnesium, has a tensile strength of 33,000 lb. per sq. in., 3 per cent elongation, Brinell hardness of 60. Extruded metal ranges in tensile strength from 40,000 to 44,000 lb. per sq. in., depending upon the composition, and from 47 to 54 in Brinell hardness. Rolled alloys run from 33,000 to 43,000 lb. per sq. in., in tensile strength, depending upon composition and condition, and from 48 to 60 in Brinell hardness. Forgings range from 37,000 to 42,000 lb. per sq. in. and from 51 to 62 in Brinell hardness.

Magnesium alloys machine well and fast, with no tendency to tear, drag or chip out, or to heat up excessively. Sheet and other shapes can be moderately cold worked, providing the bends are not too sharp, in which case heating to 500 to 700 deg. F. is recommended. Riveting is the best method of joining, although acetylene weld-

# The "Flyweight" Structural Metal

ing is practical (with care taken that no flux remains on the weld, as it promotes corrosion). Electrical resistance welding, spot, seam or butt, can be done. Soldering is not recommended.

The chemical properties of magnesium alloys are varied. In certain atmospheres the bare metal withstands weathering satisfactorily, in the North Central states, for example. In industrial atmospheres there is some evidence of dusting of the surface, but on the whole there is less corrosion than rusting of iron under similar circumstances. Magnesium alloys are resistant to many organic chemicals but they are attacked by most acids and by many aqueous salt solutions, especially the chlorides. For that reason, this material is not recommended for constant contact with salt water or salt water spray. It can, however, be protected against occasional contact by the use of suitable paints which are now easily obtainable. But, before painting, magnesium alloys must receive a preliminary dip such as a "chrome pickle" or an "alkaline dichromate" treatment to provide a surface to which primers and paint coats will adhere.

Progress in the protection field is rapid and new treatments are available even now which offer the possibility of improved protection compared to the above processes. An especially interesting method produces a dense adherent film of magnesium oxide by treatment in dilute caustic soda under high pressure and temperature. This film is capable of being dyed a wide variety of colors, the final appearance being similar to the popular "Alumilite" finish for aluminum alloys.

The present day uses of magnesium alloys, although based almost entirely on its one outstanding property—light weight—nevertheless include an impressive variety of applications. In transportation, the major uses are for airplane parts and wheels, airplane engine parts, and in a number of places in trucks, buses, and trailers,

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***FIFTH** of a series of articles dealing with "The Right Metal in the Right Place," the objective being to aid manufacturers in selecting the most suitable non-ferrous metal or alloy for their products.*

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including the bodies. Other uses of interest include portable tools, typewriters, vacuum cleaners, safety goggles, reciprocating machine parts, packaging, bottling and carrying machinery, textile machinery and high speed parts such as fan blades, rotors, impellers, and centrifugals.

The high degree to which commercial manufacturing practice in these alloys has been developed is exemplified by the type and complexity of the work done. Sand castings are made up to 200 lb. in weight. Die castings may be as small as a fraction of an ounce, or as large as 3 lb. with

an area of 100 sq. in. Sheet is made up to 20 ft. long by 4 ft. wide; structural shapes, angles, channels, tees, I-beams, etc., up to the equivalent of a 6-in. I-beam.

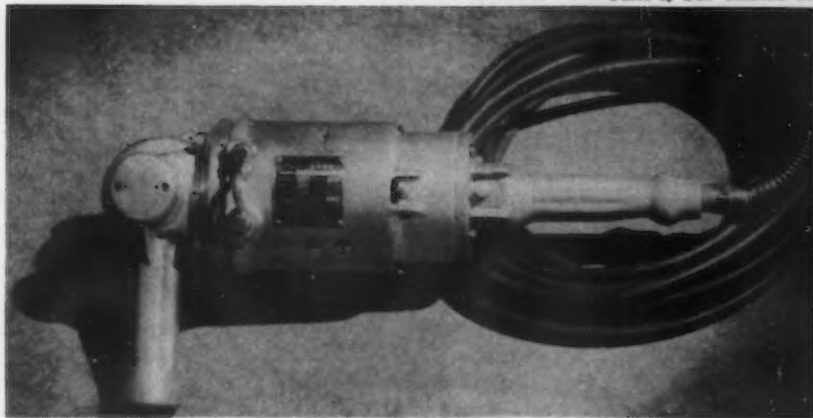
It is most noteworthy that by far the most generally used form of magnesium in industry today is the casting; 1,180,190 lb. in 1937 out of a total of 1,418,391 lb. of structural products. In line with this trend, there is at the present time important and growing interest also in magnesium-base die castings, which are showing up to excellent advantage in such products as vacuum cleaners. (The decorative finish on the exposed surfaces consists of baked-on enamels of the "wrinkle" type.)

The future uses for magnesium in industry seem to lie in the same general class as the present applications, in situations where its light weight will be helpful. As work continues, new alloys with improved properties are coming forward. A great deal of hope is expressed for the alloys containing zinc. The heat treatment of these alloys has resulted in higher physical properties than were possible in the straight magnesium-aluminum-manganese alloys. Investigations in

(CONCLUDED ON PAGE 62)

**T**HE housing and handles of this portable tool are of Dowmetal, sand cast.

Photo by Dow Chemical Co.





# THIS WEEK

## ON THE

## ASSEMBLY LINE

By W. F. SHERMAN  
Detroit Editor

*... Auto industry in active program for 1940 model production ... Output continues upward swing to 81,070 cars and trucks ... Prolonged schedules in some plants a good omen ... Strike vote ordered against General Motors.*

**D**ETROIT—The automotive industry has plunged into the work of changing over production facilities to build another line of new models for 1940. It is the season in Detroit when interest in the new designs quickens, but must be shared with a hard-to-quench interest in the tide of weekly assembly totals.

Despite the fact that four plants are closed, output continued its upward swell last week to 81,070 cars and trucks for the United States and Canada, according to Ward's Automotive Reports. This is better than any week's production in May or so far in June and, in fact, compares well with most of the previous weeks in 1939. The gain marked a continuation of the increase a week earlier when plants turned out 78,305 vehicles, and is a long way ahead of last year's corresponding 42,918.

One reason why statistics on production hold such a fascination for the industry right now is that they are indicative of a new spirit which has welled up in comparatively recent weeks. First sign that June and July would be quite happy months for the industry came in late May when sales reports showed increases, not important in themselves, but because they indicated a contra-seasonal movement.

Not long after these figures became available, another circumstance arose to enable one of the major producers to add practically a full month to the production schedule. The facts are that when the Briggs strike halted Plymouth production and started the cycle which meant that Plymouth would continue to build 1939 automo-

biles a few extra weeks an opportunity was opened for Chevrolet to take advantage of its own good current sales volume and extend its own 1939 schedule from June 15 to July 15 without serious risk that it would thereby delay its announcement of 1940 models so long that any other competitor would have an outright advantage. The Plymouth delay, while unfortunate, of course, gave even that company a chance to look over the retail sales field carefully and it still has opportunity to realize a good dollar volume of business on 1939 models while its die program for 1940 is being completed.

Last week's increase in output showed a gain largely because Ford Motor Co. added an extra day to the week's schedule. For the present week also Ford will operate five full days, but the real news about the organization concerns next week. There will be no general shutdown at the Rouge

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Today, June 29, Ford Motor Co. is formally announcing and demonstrating the new Ford tractor, a revolutionary type of farm implement. Notables from all over the country will be guests of the Ford Motor Co. at Dearborn Inn for lunch and will see the tractor operate in the field afterward. Fitting in, as it does, with a general trend to lighter and more efficient farm equipment, the Ford tractor and implements to be manufactured for it are expected to establish a new trend in the implement field.

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during the week of July 4, although for six or seven weeks the program has called for a schedule like that followed the week of May 30 (Memorial Day), when most of the plant closed for the entire week. Instead, operations will go on as usual on Monday, Wednesday, Thursday and Friday, with only the legal holiday subtracted from the work-week.

### May Not Help Steel Industry

The extra production of 1939 models, mentioned above, may or may not be reflected in steel consumption. Steel men themselves do not know whether they may already have received the benefit of longer schedules in the form of releases already on their books before the increased schedules became known. In the case of Ford, final budget figures have just been prepared and some steel will be needed to balance inventories. But this will be minimum amount because Ford plans to make use of all the finished steel on the premises to get cleaned up for 1940 activities.

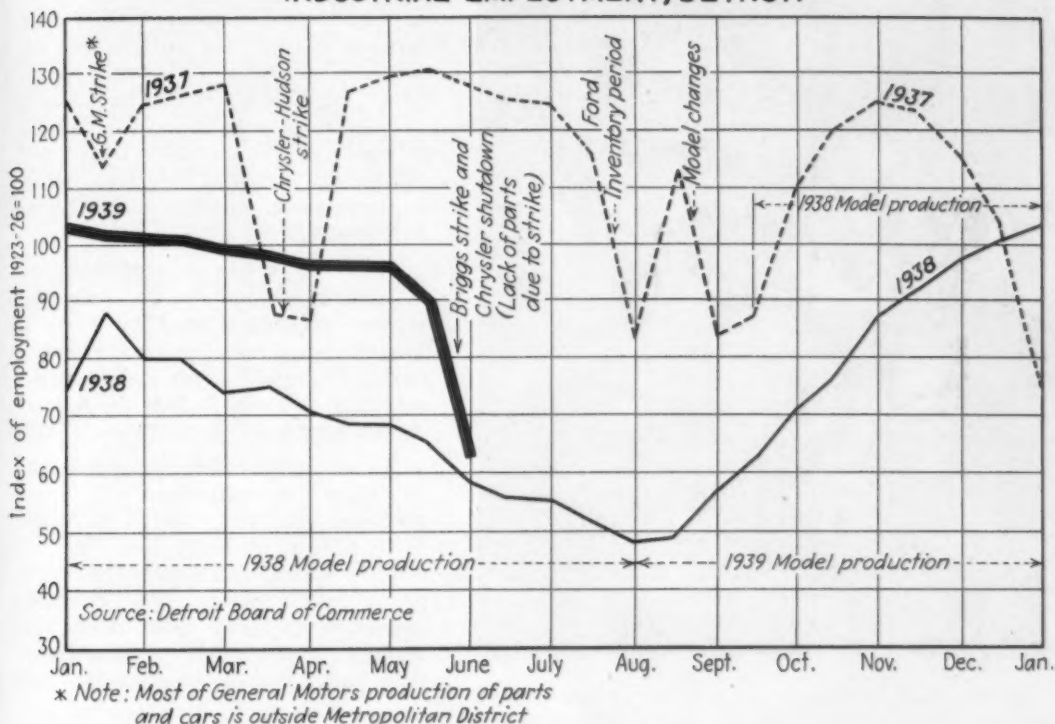
The Ford mill itself started this week to operate only one shift through July. New models are expected to be out earlier at Ford, as elsewhere. This is because the Auto Show is earlier. Aside from that, Ford is not likely to make any great concession to the idea of extra-early announcement of models. The 1940 dies will definitely not be ready until some time in September, it has been learned. This brings up the point that further consolidation of Ford body work is considered a possibility in Detroit. Ford now manufactures all of the Ford car requirements and only Mercury and Zephyr work is done outside.

### Production to Go Lower

With four plants already closed and two scheduled to join the list this week, production probably will be off about 10,000 units and will drop further as a result of the Independence holiday. By mid-July most General Motors and



## INDUSTRIAL EMPLOYMENT, DETROIT



THROUGH an error in THE IRON AGE printing shop in picking up the wrong cut, the chart of industrial employment in Detroit, on page 52 of the June 22 issue was one that had previously been published. The accompanying chart is one which should have appeared.

Chrysler plants will be making the change-over to 1940 dies, jigs and fixtures and, according to schedules which are now beginning to jell firmly, 1940 model production will begin in some plants on July 15 and in others shortly after Aug. 1, with the exception of Ford.

Packard, one of the plants already closed, is reported to have four lines of cars scheduled for next year, including the light six which was intended for introduction last spring. The fact that "four lines" are mentioned lends some credence to the unofficial story that the biggest car, the twelve, might be crossed off the list, leaving the new light car and the present six, the One Twenty and the big eight as the full line. Ford, it will be recalled, has virtually dropped the big Lincoln and it is conceivable that Packard, too, has found the giant limousines less popular even with wealthy clientele.

Graham-Paige, it is now learned, has been approached with a proposal to build an engine for Horace Dodge who is seeking a contract from England for the power plant he has developed privately. According to Graham men, the plan is only in the idea stage now.

As a result of the Stinson plane contract awarded two weeks ago, the company has surveyed its plant and equipment and decided on an extensive expansion program. New buildings will be erected adjoining the

present factory at Wayne, Mich., alongside the Stinson airport.

### Union Affairs More Complex

Auto union affairs grow more complex than international politics as additional factions assert themselves. Homer Martin's newly rechartered AFL union is threatened with a split or dissolution, or severe disciplinary action from the AFL. Dissenters in Martin's union are demanding a curb on Martin and threaten to take action within the organization if the AFL does not intervene. An argument between Martin and the Lovestoneites, a left wing group, foe of the Communist party since Lovestone broke with Moscow in 1929, has led to dismissal of many of the Lovestoneites in the union. In addition, many Martin organizers and officials have not been

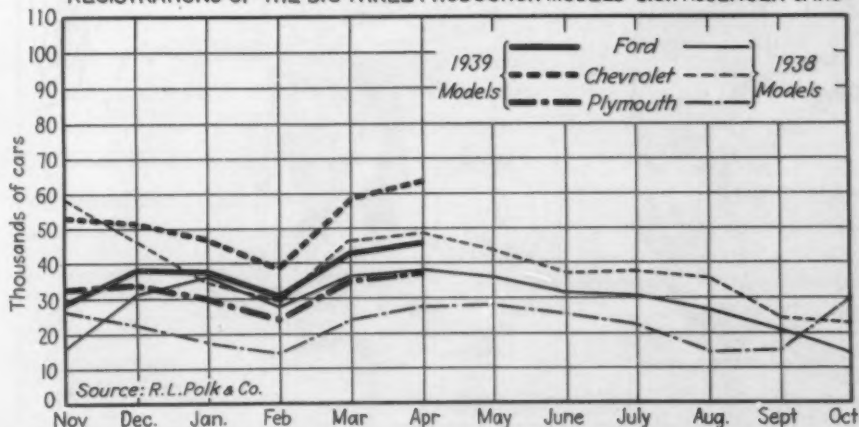
paid in about a month and a half. Recently some of the factionalists asked the AFL to appoint an administrator to take charge of expenditure of any funds which the AFL might provide to bolster the auto workers union.

The UAW-AFL, it is understood, is regarded as strategically important in the nationwide battle between the AFL and CIO, particularly since John L. Lewis announced that the CIO had virtually dropped peace negotiations with the AFL. Now, leaders are more anxious than ever to keep an AFL union active in the automobile field as a competitor for the CIO union.

### Strike Vote Ordered

Meanwhile, the UAW-CIO has authorized a strike vote in General Motors plants in Michigan, Ohio and

## REGISTRATIONS OF THE BIG THREE PRODUCTION MODELS—U.S. PASSENGER CARS





**T**HERE are only nine parts in the 1939 Buick crown spring clutch compared with 41 in the former design. Besides simplification and reduction of parts, the clutch offers greater ease of operation and improved efficiency. The photo shows assembly of the clutch in the Buick factory.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS



Indiana to be completed within five days at individual plants in a dispute between tool and die workers and the corporation. Walter P. Reuther, director of the General Motors department of the union, was instructed Sunday to notify the State Labor Board and file formal notice of intent to strike, a requirement of the State Labor Relations law of 1939.

The CIO wants a supplementary agreement written to go with the present contract signed by General Motors. Besides a welter of words having to do with hours and overtime, the union demands include the following paragraph:

"Union Label: The company agrees to allow committeemen all time necessary to affix the UAW-CIO union label to all tools, dies, jigs, fixtures or special machinery when completed in its plants. The company agrees to use only tools, dies, jigs, bearing the UAW-CIO label and further agrees to produce in its own shops all its tools, dies fixtures, and other such equipment to the extent of the technical capacity of its shops." (Text from the "United Automobile Worker.") It appears from the union's publication and comment from union men that the whole purpose of the strike is to get the union label adopted in the tool room.

## Chain Belt Co. May Absorb Baldwin-Duckworth Corp.

**C**HICAGO—Stockholders of the Chain-Belt Co., Milwaukee, on July 11 will be asked to approve the acquisition of the plant, business and equipment of the Baldwin-Duckworth Chain Corp., Springfield, Mass.

Increased earnings for stockholders are predicted as a result of the merger, according to C. R. Messinger, president of Chain-Belt, which makes concrete mixers, road pavers, malleable and steel sprocket chains, sprockets, pumps for the construction trade, belt conveying apparatus and machinery for handling coal, ashes, sand, stone, etc. Baldwin-Duckworth manufactures high speed roller chains, cut sprocket wheels, flexible couplings, automotive timing chains and certain types of conveyor chains. There is practically no duplication in the products of the two concerns.

The Baldwin-Duckworth plants in Worcester and Springfield, Mass., will give Chain-Belt the strategic advantage of maintaining inventories and



service in the East, where there are no stocks at present, as well as in the Midwest and Far West.

Except for the addition of three Baldwin-Duckworth directors to its board, Chain-Belt contemplates no change in management. Operation of the Baldwin-Duckworth properties will be continued by men who have been with that organization for years, Mr. Messinger said.

Chain-Belt earnings for the first five months of 1939 amounted to \$204,166, while Baldwin-Duckworth profits for the same period totaled \$108,257.

### Prizes Awarded for Four Most Beautiful Bridges

THE American Institute of Steel Construction has awarded prizes for the most beautiful bridges built during the past year as follows:

Most beautiful monumental bridge: Middletown-Portland bridge at Middletown, Conn.

Most beautiful medium-sized bridge: Capital bridge, across Kentucky River at Frankfort, Ky.

Most beautiful small bridge: Middle Fork of Flathead River bridge at Belton, Mont.

Most beautiful movable bridge: Lafayette Avenue bridge, over East Channel of Saginaw River at Bay City, Mich.

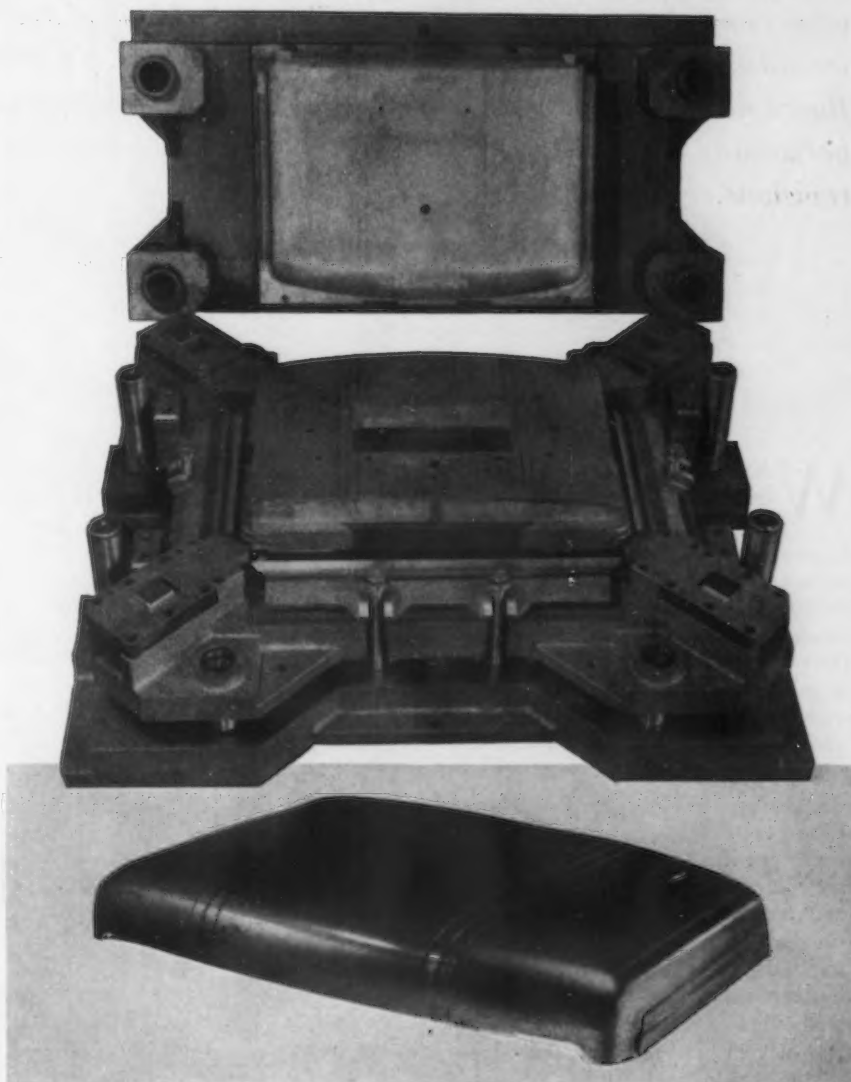
This is the 11th annual award of this kind by the institute. Announcement of the new awards was made at a dinner in the Engineers' Club on Thursday, June 22.

### Asks Aid of Plants in Segregating Steel Scrap

METAL-WORKING plants and other producers of scrap iron and steel can assist in solving some of the problems of the scrap industry by more carefully segregating various types of scrap, Edwin C. Barringer, executive secretary of the Institute of Scrap Iron & Steel, Inc., New York, declared in addressing the summer conference of the Foremen's Association of Erie, Pa.

Especially in the handling of alloy bearing steels is segregation necessary, according to Mr. Barringer. Scrap yard employees at 50c. and 60c. per hr. obviously cannot be metallurgists and the detection of alloys is easiest done at the point where the scrap is generated.

## A Reliable Source for Better Dies



• In the Cimatool Company you have an engineering staff that is thoroughly familiar with every phase of die design and sheet metal practice. You have a shop force which has been trained in die construction and has every modern facility for the complete processing of dies. Furthermore, you have an inspection department which proves every die on try-out presses to assure perfect performance before the die leaves the Cimatool plant. • Here everything has been done to give you a dependable die service. You get delivery on schedule and every tool is ready for your presses when received.



**THE CIMATOOL COMPANY**

*Dayton, Ohio, U.S.A.*

DIEMAKERS •

• TOOL MAKERS

MACHINE TOOLS



# THIS WEEK IN WASHINGTON

*... President's new lending-spending plan described by some members of Congress as "frantic" political document and by others as necessary business stimulant . . . Revision of taxes includes discarding of undistributed profits tax . . . Labor Board decision to permit employers to petition for collective bargaining elections seen as effort to head off Wagner Act revisions.*

By L. W. MOFFETT  
Washington Editor

WASHINGTON—Characterized by some members in Congress as a "frantic" political document and by others as a necessary stimulant to business recovery, the \$3,860,000,000 lending-spending program launched by President Roosevelt last Thursday promises to have hard legislative sledding, but to make the grade after bitter opposition coming chiefly from conservative Democrats and Republicans.

Realizing the strength of the opposition to the plan, Administration forces are drafting a "simplified" omnibus bill which is expected to omit certain of the most objectionable features of the program, including the proposal for foreign loans through the Export-Import Bank. The legislation, which will be introduced simultaneously in both the House and Senate, will be placed on the preferred list and effort made to enforce passage at the present session of Congress.

Broadly, the measure will create new Federal agencies, expand loan power, and give the President authority to put the program into effect. While an interest rate of 2.75 per cent has been approved by the Administration, it is not known whether the legislation will specify the rate of interest to be charged on the Government loans.

Heading the lending agencies will be Jesse H. Jones, chairman of the Reconstruction Finance Corp., and John M. Carmody, chairman of the Rural Electrification Administration. Mr. Jones was appointed administrator of the consolidated Federal Loan Agency, which on July 1 will take over 10

chief lending and credit organizations. Mr. Carmody was appointed administrator of the Federal Works Agency, to be set up on the same date at which time it will merge and take over the functions of a number of Government agencies. It is reported that Mr. Jones will be succeeded as RFC chairman by Emil Schram, now a director of that organization.

The Federal Loan Agency will be a consolidation of the RFC, Electric Home and Farm Authority, the Federal Housing Administration and their associated agencies, as well as the Export-Import Bank of Washington. The Federal Works Agency will take over the Bureau of Public Roads, the public building branch of the Procurement Division, Treasury Department, and the branch of building management of the National Park Service, PWA and WPA.

## First Year's Limit \$870,000,000

The President proposes that the limit of loans for the fiscal year 1940 be \$870,000,000. Included in the program is expansion by \$800,000,000 for the United States Housing Authority. Unlike other items this one is not listed in the category of self-liquidating loans.

Provisions of the program which have met greatest opposition are those calling for loans to foreign countries and for toll bridges and toll roads. If the foreign loan provision is omitted from the bill, opposition would be less. There are reports, however, that the Administration, after allaying Congressional concern by this strategy will proceed to make foreign loans

through the Export-Import Bank on the ground that it already has authority to do so.

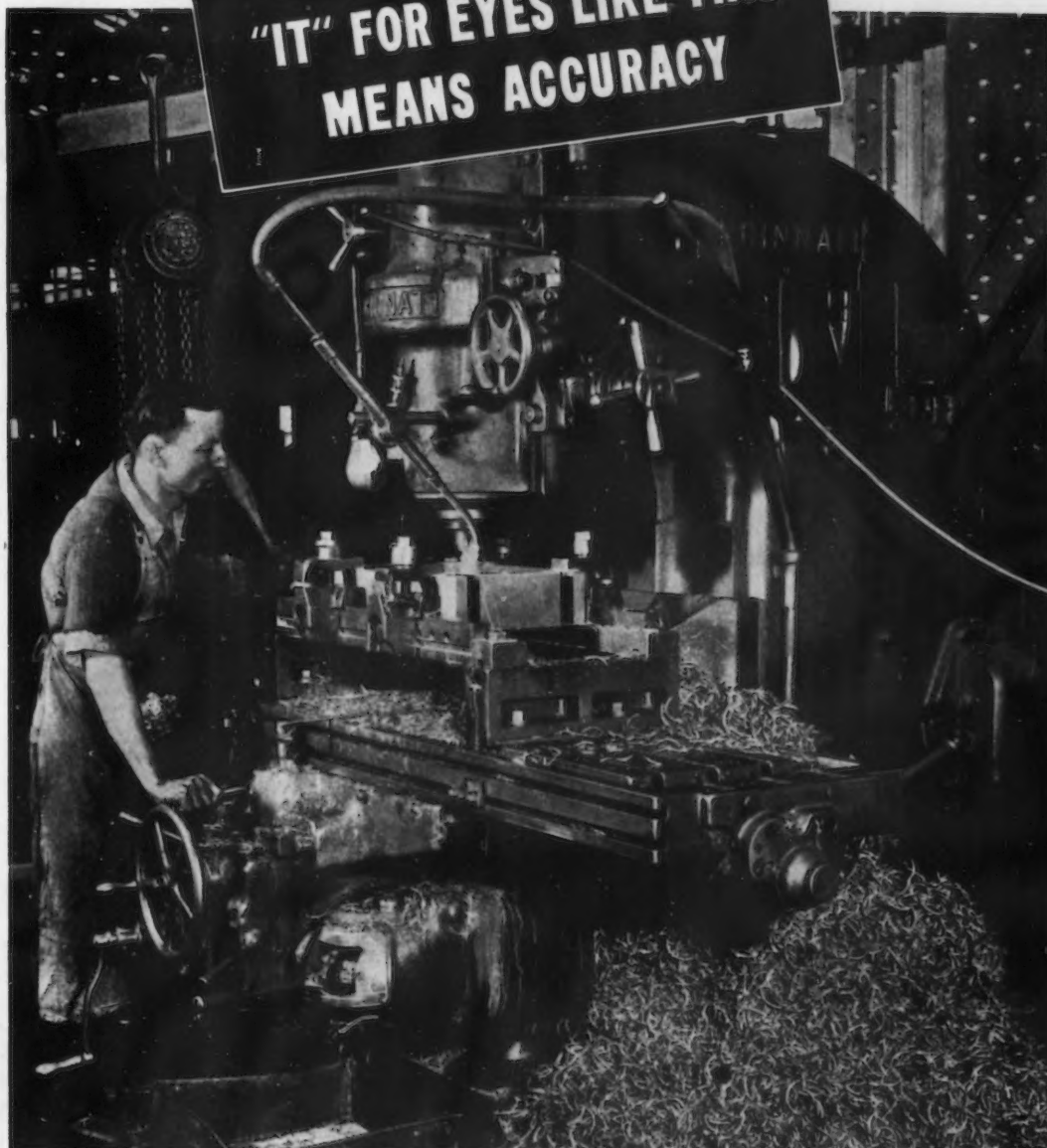
Striking out the provision for so-called self-liquidating toll roads, bridges, high-speed highways and city by-passes would mean elimination of one of the largest possible sources for use of steel and machinery. Of the \$3,061,000,000 it is proposed to apply to "self-liquidating" projects over a two to seven-year period, the largest single item is \$750,000,000 for toll roads, bridges, etc., to be spread over a four-year term, the loan disbursement for the fiscal year 1940 being \$150,000,000. Not only is there strong opposition in Congress to making loans for toll roads, bridges, etc., but the Bureau of Public Roads, in a report transmitted to Congress by the President himself less than two months ago, said that as a general thing toll roads were traffic repelling. The bureau pointed out that there were only a few sections of the country where traffic is heavy enough to support a toll road and make it pay. The report stated that if Congress wished to "experiment" with the subject further it authorize a road connecting Boston and Washington, where, the bureau said, there was reasonable hope in recovering the tolls.

## Railroad Loans in Doubt

There is also considerable doubt whether the proposal for purchase by the Government, probably under RFC, of all types of railroad equipment for lease to the carriers would meet with a great deal of success. It is well-known that railroads generally are cold to proposed railroad loan legislation. They take the position that their capital expenditures are now too heavy and out of line with revenue returns and the unfavorable outlook for any substantial upturn in traffic in the near future. The railroad equipment program would extend over a period of three years. It is contemplated that the outlay for the fiscal year 1940 would be \$100,000,000.

RFC Chairman Jones recently told the House Committee on Interstate and Foreign Commerce that he was opposed to the recommendation made by the committee of six railroad executives and labor leaders for 2 per cent equipment loans. He said he did not like the idea of lending money at 2 per cent and not having any of it

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come back for five years. Opposing a provision then in the Lea bill to limit equipment loans to \$300,000,000, Mr. Jones said if loans were not made up to that amount "we'll catch a lot of hell."

Though there is distinct skepticism both in and out of Congress that many of the projects listed in the program would be self-liquidating, such as water works, sewage disposal plants, and hospitals, the President sought to emphasize that the loans would all be

repaid to the Government. He said that after the program had been carried out, and unemployment still existed, the money could be loaned again. The program thus is proposed as a permanent one and would be operated through a revolving fund.

It is on the contention that the program is of the self-liquidating type that the President proposes that it be put on an extra-budgetary basis. Many members of Congress, insisting it is simply a political subterfuge, with an

eye on the 1940 Presidential campaign, scoff at the idea of a self-liquidating undertaking. On the contrary they maintain that, as clearly shown by precedent, the Government—that is, taxpayers—would be a heavy loser because it would be unable to recover anything like all of the loans.

## Government Orders for Week Ended June 17

**W**ASHINGTON — Contracts totaling \$520,002 for iron and steel products are reported by the Labor Department's Public Contracts Division for the week ended June 17. Contracts amounting to \$208,667 for non-ferrous metals and alloys and \$342,016 for machinery are reported by the division for the same period. Details follow:

### Iron and Steel Products

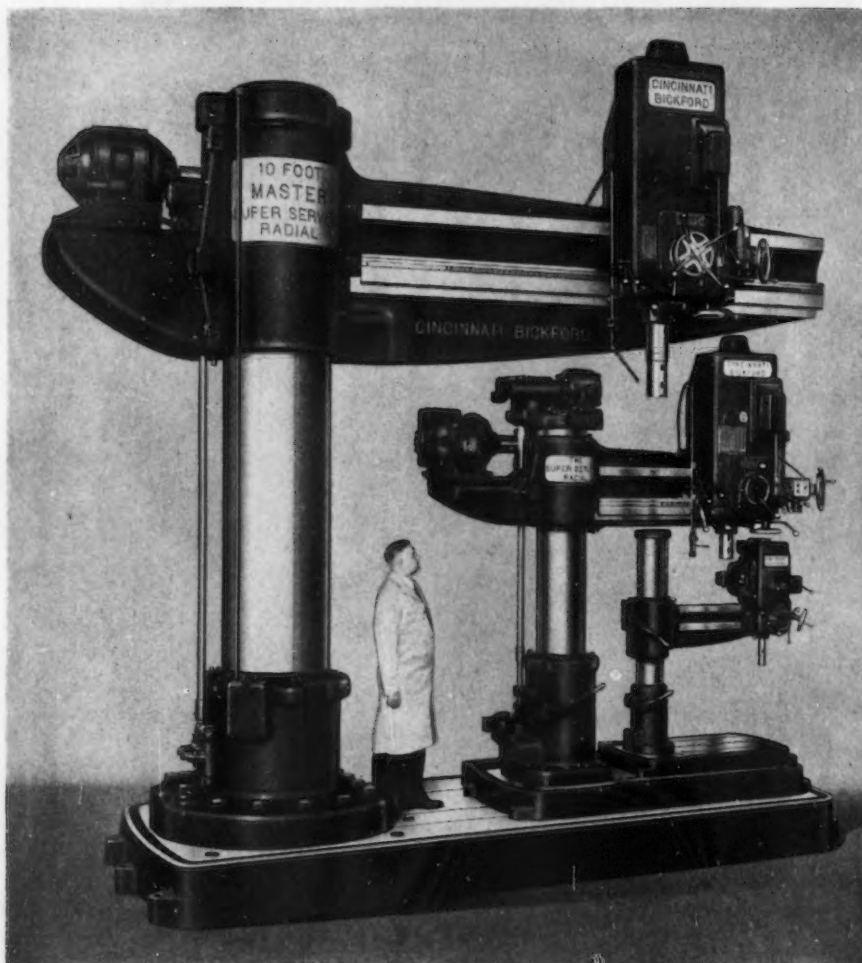
Camden Forge Co., Camden, N. J., steel forgings .....	\$41,615.00
National Tube Co., McKeesport, Pa., steel flasks .....	11,845.75
Camden Forge Co., Camden, N. J., steel forgings .....	48,287.80
The Midvale Co., New York and Philadelphia, rough forgings ..	13,825.54
Pennsylvania Forge Corp., Philadelphia, forgings .....	10,800.00
Pennsylvania Forge Corp., Philadelphia, steel forgings .....	42,880.00
Allis-Chalmers Mfg. Co., West Allis, Wis., steel forgings .....	44,489.00
Struthers Wells-Titusville Corp., Titusville Forge Division, Titusville, Pa., steel forgings .....	42,560.00
Breeze Corporations, Inc., Newark, N. J., doors, water .....	50,333.00
Noland Co., Inc., Washington, welded steel pipe .....	12,326.37
Dravo Corporation, Pittsburgh, dredge pipe .....	22,567.50
Albert & Davidson Pipe Corp., Brooklyn, wrought iron pipe ..	10,713.91
Lukens Steel Co., Coatesville, Pa., steel plates .....	16,098.43
Combustion Engineering Co., Inc., New York and Chattanooga, Tenn., boilers .....	24,237.99
Columbia Steel Co., San Francisco, steel bearing piles .....	112,635.60
Electro Metallurgical Sales Corp., New York and Alloy, W. Va., ferro-vanadium and ferro-chrome	14,786.83

### Non-Ferrous Metals and Alloys

Aluminum Co. of America, Edgewater, N. J., aluminum alloy ..	\$86,398.16
Aluminum Co. of America, Pittsburgh, specifications, metal ...	17,659.43
Revere Copper & Brass, Inc., Baltimore Division, Baltimore, sheets, tube .....	23,124.52
The International Nickel Co., Inc., Huntington, W. Va., nickel, copper, alloy .....	81,484.91

### Machinery

The Monarch Machine Tool Co., Sidney, Ohio, lathes .....	\$14,504.00
Landis Tool Co., Waynesboro, Pa., grinding machine .....	10,762.80
Wm. Sellers & Co., Inc., Philadelphia, drilling machine .....	35,990.00
Universal Stamping Machine Co., Stamford, Conn., parts, canceling machine .....	10,000.00
Harnischfeger Corp., Milwaukee, dragline excavator .....	18,100.00
C. H. Wheeler Mfg. Co., Philadelphia, crane machinery .....	187,000.00
N. Y. Shipbuilding Corp., Camden, N. J., distilling units .....	20,660.00
Lidgerwood Mfg. Co., Elizabeth, N. J., gear, steering, elec. ....	45,000.00



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## Labor Board Permits Employers to Petition for Bargaining Elections

WASHINGTON—Interest in the National Labor Relations Board's decision to amend its rules to permit employers under certain circumstances to petition for collective bargaining elections was mounting this week and speculation increased as to whether the effect of the move will be to head off efforts to investigate the board and to revise the Wagner Act. Some observers regarded the announcement as an opening wedge through which broader revision of the law may be possible next session.

Members of the House who are openly hostile to the NLRB used the announcement as a cue to press for their proposed investigation of Labor Board activities—a proposal which for months has been hanging heavily over the heads of Labor Board members. Some Congressional members regarded the Labor Board's decision as a step in the right direction but pointed out that except in a few instances the change may not prove of great importance and that in any event the new rule fails to go to the heart of the problem. They indicated that the NLRB merely wanted to patch up the existing law when what was actually needed was a revised law and a fresh approach to the labor-relations problem through an impartial Congressional investigation as proposed in the pending House resolution.

Announcement of the board's decision came after AFL Counsel Joseph Padway forecast before the House Labor Committee on June 20 that the board would not change its rules to permit employer elections until after Congress adjourns. Advised by NLRB General Counsel Charles Fahy that the board had already taken steps to put the change into effect, Mr. Padway told the committee to "chalk it up as one victory for the AFL." He added, however, that the proposed change should be written into the law "because some subsequent board may unmake the rule."

The day following, the NLRB affirmed the Fahy statement by announcing in a mimeographed statement to the press that it had "ordered amendment to its rules and regulations to permit employers to petition the board in representation cases where two or more bona fide labor organizations are claiming a majority but neither petitions the board for certifi-

cation." The board, the announcement said, will also amend its rules so that the period of notice of hearing in unfair labor practice cases shall be not less than 10 days. The former rule allows five days' notice.

Board Chairman J. Warren Madden

called the changes "part of a general revision" undertaken by the board "some months ago," although an examination of the NLRB's functions during the past three years discloses that the last prior amendments to its rules to be made public were in April, 1936.

Meantime, the Senate hearings on Wagner Act revision continued last week and heard David R. Clarke, counsel for the Illinois Manufacturers



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- 100% positive automatic stop.
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Association, declare that the majority rule provision of the Wagner Act had made possible the undeclared war between the AFL and the CIO. It was his prediction that the majority provision would generate future labor troubles in the steel, automobile and coal industries. He urged committee members to approve the amendments proposed by Senator Burke, Democrat of Nebraska, which deal, among other things, with the unit rule.

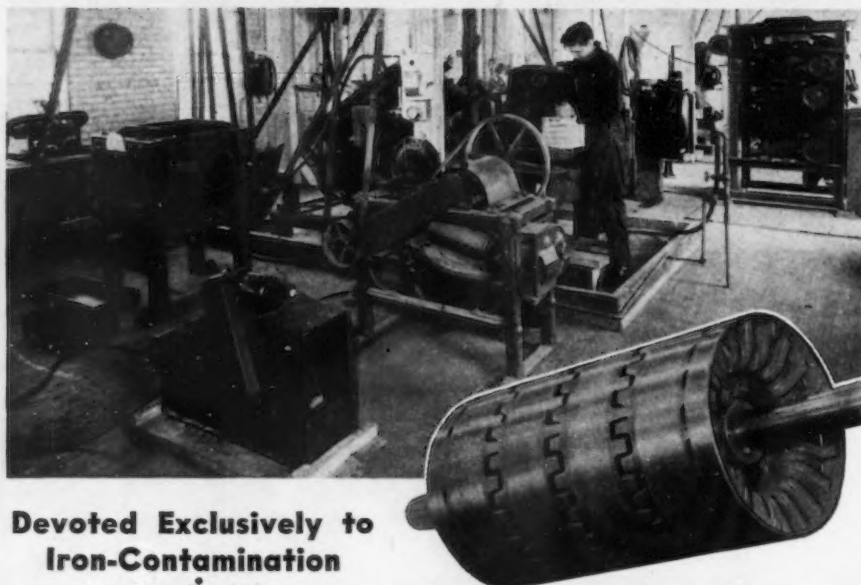
Even as Mr. Clarke was speaking of

labor's undeclared war, both the two factions of organized labor appeared farther apart than ever in their efforts to negotiate a settlement at the suggestions of the White House. It was generally conceded that nothing short of additional Presidential prodding will bring the two groups together again in the near future.

Mr. Roosevelt, who has received no formal report on the labor peace conferences inaugurated by him last March, has gone on record as still

hopeful the two labor organizations will be able to work out a plan for settling their three-year-old dispute. Secretary of Labor Frances Perkins, too, persisted in looking at the labor situation through rose-tinted glasses. After she claimed in a Denver, Colo., interview that she possessed "confidential information" that the two groups would settle their differences within a few months, AFL President William Green retorted that peace prospects would improve if the Secretary of Labor would "keep her mouth shut."

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### Walsh-Healey Act May Apply to \$4000 and Over

**W**ASHINGTON—A compromise plan to broaden the Walsh-Healey Public Contracts Act, bringing contracts of \$4000 and over under the law and denying contracts to firms held by the courts to have violated the Wagner Act, has been reported favorably by the Senate Education and Labor Committee. While Senate passage is expected, it is regarded as highly doubtful that action can be taken in the House before adjournment.

Even if the measure is brought to the floor, there is grave doubt that the House will approve the bill because of the provision banning contractors held to have violated the Wagner Act. While the provision has been considerably softened over the one proposed by the CIO a year ago, which would have blacklisted persistent violators as determined by the NLRB, there is reason to believe that it still contains enough objectionable features to prevent passage.

Both War and Navy departments have been actively opposing the move to broaden the law, protesting that contractors are already overburdened with unduly stringent requirements before they are eligible for Government work. Some Government departments are known to be dividing up their contracts whenever they can so that the total amount is below the present limit of \$10,000 in order to free contractors from increasingly severe restrictions imposed by the law.

Secretary of Labor Perkins has recommended for the past two years that the contract limit be lowered to \$2000 to include more contracts under the law's provisions. The Walsh-Healey law was originally passed by Congress as stop-gap legislation after the NRA was invalidated.



## Undistributed Profits Tax Discarded in New Bill Passed by Congress

WASHINGTON — The undistributed profits tax, assailed by industry and many Congressional members alike as a business deterrent but identified until recently as part and parcel of what the White House regarded as a necessary part of the tax laws, was thrown out the window last week when both Houses of Congress approved in less than five days the \$1,644,300,000 corporate tax bill.

With the approval of the President, the measure will remove the much-criticized undistributed profits tax and substitute a flat income rate of 18 per cent on corporations having net incomes of more than \$25,000 a year; but the present rates on corporations having incomes of less than \$25,000 will be retained. Nuisance taxes, which were due to expire June 30, and the corporation tax structure, scheduled to expire Dec. 31, are renewed for another two-year period by the bill.

Senator Harrison, Democrat of Mississippi and chairman of the Senate Finance Committee, referred to the approved bill as "a relief measure" for business but described it as not going far enough. It was Senator Harrison who clashed with the White House just a year ago on the undistributed profit tax principle but the President at that time was adamant. More recently, however, Mr. Roosevelt has observed that he had no objection to elimination of the undistributed profit tax provided that it open no new loopholes for tax avoidance and that it raise revenue at least equivalent to the present tax yield. Apparently the measure met these two conditions satisfactorily because Mr. Roosevelt, while not elaborating, characterized the bill as a fine measure after it passed the House in a 358 to 1 vote.

The approved tax bill is generally expected to raise within \$25,000,000 to \$30,000,000 of the amount accruing annually under the existing law, depending upon whether business improves. While opinions expressed in Congress differed on the matter, the Treasury was known to feel satisfied with the anticipated tax yield under the new measure.

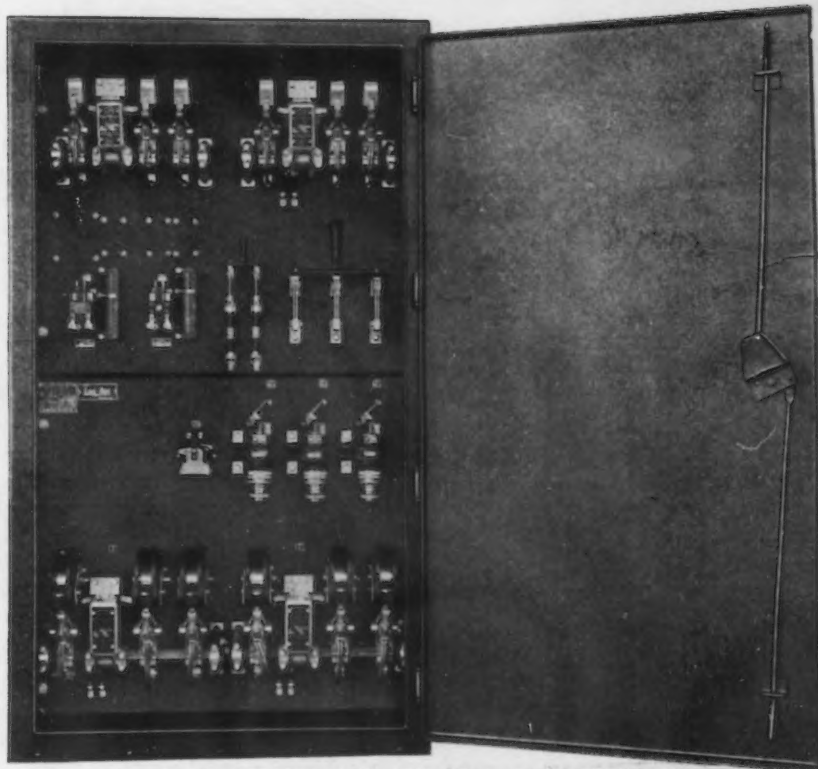
Meanwhile, Senate Majority Leader Barkley proposed the creation of a joint Congressional committee whose job would be to study the entire tax

structure during the recess and to come back next year with the idea of revamping the whole structure. It was his view that such a program as that proposed by Senator La Follette, Progressive of Wisconsin, designed to broaden the income tax base, and a study on the relationship between state

and Federal taxation ought to be included in the survey.

Senator La Follette came close to having his proposal approved by the Senate last week. A roll call showed a total of 39 to 37 members in favor of an amendment to the tax bill which would have increased surtax rates on net taxable incomes between \$6000 and \$100,000. The amendment was defeated, however, after Senator Harrison engaged in what La Follette described as "footwork" and played for

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time, asking for a recapitulation of the vote.

The White House has recently expressed the opinion that the income tax base should be broadened but at the same time issued a warning not to expect much in the way of additional revenue. Editorials which assume that broadening the income tax base would pay off the national debt have been characterized by the President as so much rot. It was Mr. Roosevelt's opinion that the cost of collections would take up most of the added revenue.

#### Features of New Tax Bill

In addition to killing the last remnant of the controversial 2½ per cent undistributed profits tax, the measure passed by both Houses makes these changes in the corporation tax structure:

1. Beginning next Jan. 1, corporations can carry over their net operating business losses for a two-year period.

2. Corporations can increase but not decrease their capital-stock tax valuations for the fiscal years ending June 30, 1939, and June 30, 1940. The present law permits a new declaration of value by either raising or lowering capital stock value for capital-stock tax purposes for the fiscal year ending June 30, 1941.

3. While it retains existing rates for corporations having incomes of less than \$25,000, a safeguard is provided to prevent corporations having incomes for example of \$25,001 from suffering a tax jump of \$900 because of the sharp increase in the rate from 16 to 18 per cent.

4. Taxed at a flat rate of 18 per cent regardless of the amount of their income will be foreign corporations engaged in a trade or business within the United States, and mutual investment companies. Foreign corporations not engaged in business within the United States are taxed at the rates provided for in the present law.

5. Special treatment accorded corporations in bankruptcy or receivership, joint-stock land banks and rental housing corporations because of the undistributed profits tax will be abandoned so that they receive the same treatment as other corporations.

6. Except for domestic and foreign personal holding companies, the \$2,000 limitation applicable to capital losses of corporations under existing law has been repealed and instead capital losses on assets held for more than 18 months, to be applied in full against

ordinary net income for the taxable year in which the loss was realized, will be allowed.

Written in the bill primarily at the request of the Association of American Railways, whose members hope to reduce their debt some \$2,000,000,000 and their carrying charges by about \$90,000,000 annually, is a provision permitting a corporation which establishes to the satisfaction of the Internal Revenue Bureau that it is in an unsound financial condition to redeem for the next three-year period its bonds, notes, or other evidence of indebtedness in existence on June 1, 1939, at less than their face value without recognition of gain.

#### U. S. Machinery Exports To North China Expand

WASHINGTON—Japan's effort to industrialize Manchuria and North China is reflected in a sharp increase in Japanese industrial machinery exports during the first quarter of 1939. Total shipments of all machinery in the January-March period of 1939 amounted to \$11,348,000 as compared with \$7,114,000 in the corresponding period in 1938, reports to the Commerce Department indicate.

Rolling stock, metal-working and textile machinery represented the major part of Japan's machinery exports during the first quarter but substantial shipments, the department said, were also recorded for pumps, wood-working machines and other machinery. On the other hand imports of industrial machinery into Japan in the first quarter were estimated at \$5,610,000, an increase of \$2,543,000 over the corresponding quarter last year.

#### Moltrup Steel Products Co. Ordered to Disband Union

WASHINGTON—The National Labor Relations Board has ordered the Moltrup Steel Products Co., of Beaver Falls, Pa., to disband the Independent Brotherhood of Moltrup Steel Workers; to end the alleged practice of discouraging membership in the CIO's Steel Workers Organizing Committee, and to reinstate with back pay five employees who were purportedly discharged to discourage membership in the SWOC.

An NLRB announcement said the company had been directed to post compliance notices for a 60-day period.

#### Freight Cost on Steel Distribution Is Part of Cost, Says Woodring

WASHINGTON—Secretary of War Harry H. Woodring, expressing opposition to some phases of the Wheeler-Lea transportation measure giving the Interstate Commerce Commission jurisdiction over water carriers, said in a letter published in the Congressional Record last week that "the aggregate freight bill paid in the distribution of steel both by rail and by water, is one of the elements of production, and in the measure that it is made less costly by water transportation, its base price all over the country is reduced."

This basic fact, the Secretary said in his letter directed to Chairman Lee of the House Committee on Interstate and Foreign Commerce, results in the uniform distribution of the benefits of water transportation throughout the land instead of permitting only the consumer who is located at a river port to benefit. Mr. Woodring said that investigation by the War Department tends to confirm the truth of the claim that the consumer pays the same price for steel, petroleum products and grain whether the commodity moves "cheaply by waterway or expensively by rail," but disproves the further claim that the difference is pocketed by the middleman and not passed on.

"With the sharp competitive conditions and narrow margins of profit under which business is conducted today, it is absolutely impossible to 'pocket' any savings permanently," Secretary Woodring reasoned. "It requires only the most elementary economics to show that they are either reflected directly in the base price of the commodity, or at the worst are 'put back into the business' to increase production, to extend the market, or to reduce the cost of manufacture."

The letter was inserted in the record at the request of Representative Lindsay C. Warren, Democrat of North Carolina, who said the department's note "literally blasts the fallacies of the arguments of those who would raise freight rates and deprive the people of this country of the savings and economies of low-cost water services." The Congressman heads a group of House members forming a steering committee to oppose passage of the Wheeler-Lea bill.

Lincoln Electric Railway Sales Co., Cleveland, has appointed Thomas V. Brooke sales engineer in its Chicago office at 310 South Michigan Avenue.



## Value of Cooperative Effort Stressed At Malleable Founders' Meeting

THE necessity for aggressive, co-operative effort in developing new markets and product research was stressed by numerous speakers at the annual convention of the Malleable Founders' Society, held last week at the Westchester Country Club, Rye, N. Y. Registration ran well over 90 per cent of the society's membership.

Stressing this thought, Stanley A. Knisely, director of advertising Republic Steel Corp. and president National Advertisers' Association, told the foundry executives that cooperative promotion has proved in other fields that opportunities to expand the consumption of a product are practically limitless and can be very successful. Time has shown to be all wrong, Mr. Knisely said, the opinion that there was just so much business available and that all the promotional activities possible would not enlarge that amount.

Mr. Knisely, who was guest speaker at the Friday meeting, felt that cooperative efforts were more efficient than individual efforts because they eliminated the possibility of covering the same ground more than once. Cooperative effort, he said, was distinctly creative, rather than competitive. Cooperative advertising was pointed out as one of the most important phases of cooperative promotional efforts. What the machine tool is to production, advertising is to selling, the foundrymen were told.

Mr. Knisely summed up his views by saying, "Practically all manufacturing is face to face with the new competition of industry against industry. This means organized competition. The old competition could be met by an increase in individual effort. The new competition can be met only by pooling your combined resources in the interest of the entire group."

### Molding Sand Discussed

The day's business session was opened by James H. Lansing, the society's shop practice engineer, with a report on the results of a recent survey on the use, handling, preparation and selection of molding sand. An interesting feature brought out by the survey was that in the production of heavy castings there seemed to be a distinct trend toward the use of synthetic sands, while in the production

of light castings there was a preference for natural sands. Mr. Lansing also explained the features of the summer training course being sponsored by the society at the Rensselaer Polytechnic Institute, Troy, N. Y.

Reports were also made by Leon J. Wise, Chicago Malleable Casting Co., Chicago, on research and product improvement; by John A. Wagner, Wagner Malleable Iron Co., Decatur, Ill., on cost standards, and by Robert Belt, the society's secretary, on hourly earnings and work-week. The afternoon was spent golfing and visiting the

mine the effect of barium oxide on shrinkage. Although he felt the tests were by no means conclusive, they did seem to indicate that the use of this material had no pronounced advantage. A newly developed process for welding malleable iron was also touched upon briefly. The professor felt that this process was probably best suited to the welding of thin-walled castings. The last topic covered by Prof. Touceda was a comparison of the elongation and reduction in area values of wrought iron, cast iron, rolled steel and malleable iron.

### Fields for Market Development

Discussing market developments, E. E. Griest, Fort Pitt Malleable Iron Co., Pittsburgh, told the assemblage

## Malleable Founders' Society Officers for 1939-1940

**P**RESIDENT, F. O. Parker, Acme Steel Malleable Iron Works, Buffalo. Vice-President, J. A. WAGNER, Wagner Malleable Iron Co., Decatur, Ill. Secretary, ROBERT E. BELT, Cleveland.

**Directors:** C. L. CARTER, Albion Malleable Iron Co., Albion, Mich.

C. A. GUTENKUNST, Jr., Milwaukee Malleable & Gray Iron Co., Milwaukee.

W. V. TISCORNIA, Auto Specialties Mfg. Co., St. Joseph, Mich.

A. HASWELL, Dayton Malleable Iron Co., Dayton, Ohio.

A. F. JACKSON, Michigan Malleable Iron Co., Detroit.

H. A. MARTI, Maumee Malleable Iron Co., Toledo.

C. H. McCREA, National Malleable & Steel Castings Co., Cleveland.

H. N. ALBRIGHT, Columbia Malleable Castings Corp., Columbia, Pa.

L. A. DIBBLE, Western Malleable Iron Co., Naugatuck, Conn.

F. C. TUTTLE, Jr., Belcher Malleable Iron Co., Easton, Mass.

World's Fair. In the evening the annual dinner was held.

At the Saturday meeting, Enrique Touceda, the society's consulting engineer, discussed several technical aspects of malleable production. One such subject was the influence of lead on the structure and machinability of malleable. Recent experiments had indicated, Professor Touceda stated, that lead additions have a tendency to make ordinary malleable pearlitic, but with pearlitic irons the tests indicated that some slight improvement in machinability might be expected from the additions. The lead additions in the tests ran about 0.25 per cent, but the amount remaining in the finished product was extremely low due to the tendency of lead to volatilize at the ladle.

Professor Touceda also discussed some experiments conducted to deter-

mine the effect of barium oxide on shrinkage. Although he felt the tests were by no means conclusive, they did seem to indicate that the use of this material had no pronounced advantage. A newly developed process for welding malleable iron was also touched upon briefly. The professor felt that this process was probably best suited to the welding of thin-walled castings. The last topic covered by Prof. Touceda was a comparison of the elongation and reduction in area values of wrought iron, cast iron, rolled steel and malleable iron.

Federal legislation, with reference to its effect on the malleable industry, was appraised by Arthur F. Jackson, Michigan Malleable Iron Co., Detroit, while current political problems were covered by Robert E. Belt, secretary. James L. Cawthorn, Jr., the society's development engineer, explained what the society was doing in the way of publicizing malleable iron.

## Granite City Steel Co. Cuts Wages in Highest Paid Group 2 to 5c. Per Hr.

**A** NEW agreement by which 1500 employees of the Granite City Steel Co., Granite City, Ill., have taken a wage cut of from 2 to 5 per cent because the company has been operating at a loss becomes effective on Friday of this week. The employees are members of the Amalgamated Association of Iron, Steel and Tin Workers, an affiliate of the CIO. The reduction applies to all departments.

The contract provides that there shall be no wage cut for employees receiving the minimum of 62½c. per hr., but employees getting more than the minimum and up to 79c. per hr. will receive 2 per cent cut; from 80 to 90c., 3 per cent, and 91c. up a 5 per cent reduction.

The Granite City Steel Co. expended last year between \$5,000,000 and \$6,000,000 in plant improvements, including new cold and hot strip mills, and a second cold strip mill is being erected.

In its report of operations for the

first quarter of this year, the company pointed out that production costs as applied to wages were too high.

### Furnace Makers Elect C. T. Holcroft President

**C.** T. HOLCROFT, Holcroft & Co., Detroit, was elected president of the Industrial Furnace Manufacturers' Association at the annual meeting held last week at Briarcliff Lodge, Briarcliff Manor, N. Y. Other officers elected at the meeting were: Steel division, J. W. Barker, Rust Furnace Co., Pittsburgh; combustion division, R. E. Talley, George J. Hagan Co., Pittsburgh; glass division, J. E. Frazier, Frazier Simplex, Inc., Washington, Pa.; oven division, A. B. Clark, J. O. Ross Engineering Corp., New York; ceramic division, R. W. Porter, Swindell-Dressler Corp., Pittsburgh; resistance furnace division, G. W. Tall, Jr., Leeds & North-

rup Co., Philadelphia, and junior past president J. A. Doyle, W. S. Rockwell Co., New York. Stewart N. Clarkson was reelected executive vice-president.

The progress of the plan recently launched by the association to obtain greater uniformity of metal products was discussed at the meeting, and it was announced that a joint committee consisting of members of the American Iron and Steel Institute, American Society for Metals, Industrial Furnace Manufacturers' Association, Copper and Brass Mill Products Association and the Aluminum Association will be formed to consider the adoption of such plant shop practices as are necessary to obtain this uniformity.

The problem of taxation, particularly multiple taxation on interstate business, and a proposed set of trade practice rules for the industrial furnace and oven industry were among the other subjects discussed at the meeting.

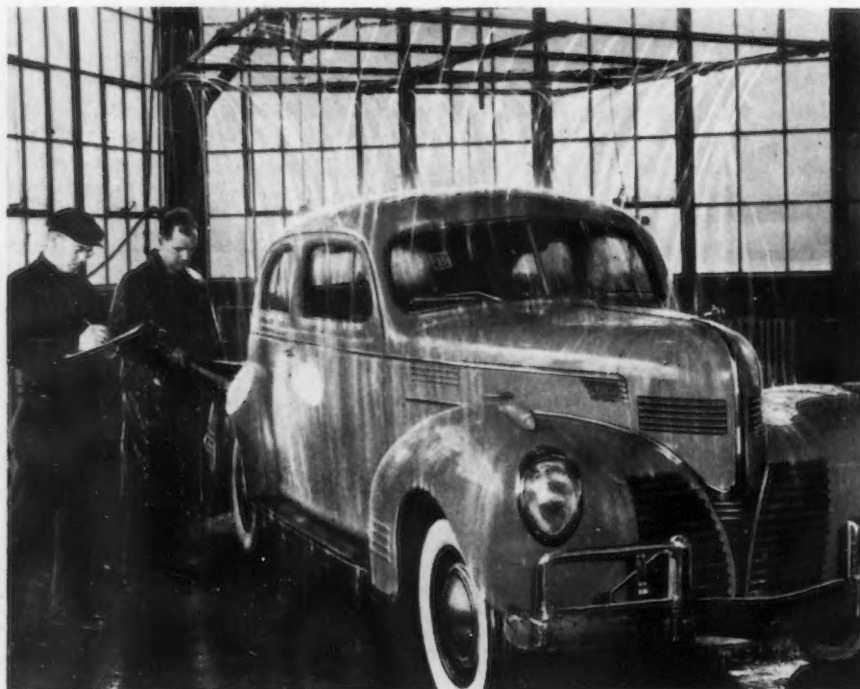
### Building Activity Boosts Copper and Brass Sales

**B**ERTRAM B. CADDLE, secretary of the Copper and Brass Research Association of New York, states that consumption of copper for roofing materials, brass pipe and copper tube for water lines, and other better building materials made of copper and its alloys was 40 per cent greater in May than in any other month during 1939. He said that the May tonnage, with one exception, was larger than any month during the preceding year. He credited the gain mainly to the activities of the Federal Housing Administration and the United States Housing Authority.

### General Laminated Products Bought by General Electric

**T**HE General Electric Co. has announced the purchase of the equipment and facilities of General Laminated Products, Inc., of New York, according to G. H. Shill, manager of the G-E plastics department. For the past six years this company has been distributor and fabricator of G-E Textolite laminated materials, and under the new plan the Meriden, Conn., plastics plant of General Electric will assume those services.

General Laminated Products, Inc., of Illinois will continue as fabricator and distributor of Textolite laminated materials in the Middle West.



**T**HE "rain-maker" is employed by Dodge to test the entire car in an artificial downpour. The drenching searches every seam of the body structure for chances to penetrate to the interior of the car. While the man-made rain tests doors, windows, cowl, side ventilators, hood and luggage compartment—checkers go over every part of the car, inside and out, making sure that it is watertight. Through this kind of test, and by running automobiles through trenches filled with water, engineers have virtually eliminated the possibility of the later model cars being stalled in rainstorms.



## Control of Trade Associations by Management Firms Under Fire

WASHINGTON — Declaring that the entire tendency is to raise or fix prices, the Department of Justice on Tuesday announced that a Federal grand jury in the Southern District of New York will shortly begin an inquiry into the control of trade associations by management engineering companies. Pointing out that this is a comparatively new use of trade association machinery but that practices complained of are growing rapidly, the department said that it regards this grand jury investigation as one of the most important it is now undertaking. Its statement, the department said, is made so that there will be no question as to its policy toward such organizations. It was also stated that its position was being announced so that no claim of acquiescence can be urged by "those whom, through the limitation of time and personnel, the department is unable to immediately investigate."

The department alleges manufacturers join together and employ engineering firms to suppress competition. Various so-called devices to this end are listed in the statement.

Reference is made to the manufacture of a particular product that is scattered among a large number of independent units with their own counsel, their own accountants, and their own policy-making officials. Assuming that this condition is creating competition which hurts a small but aggressive group within the industry, the department says, the group employs a management engineering firm. The publicly stated purpose, it was said, is that of collecting statistics and disseminating information but the real purpose is said to be that of discouraging competition. The engineering firm, it was said, conducts a militant campaign among the scattered manufacturers to organize them into trade associations.

### Aim at Industry Control

"In such campaigns the benefits which come from higher prices and the discouragement of competition are usually emphasized," the statement said. "The firms who desire to maintain their own price policies are then subjected to increasing pressure. Finally, when a majority of the units are organized the engineering firm pro-

vides the permanent personnel which operates the trade association. Through that control of the personnel the whole industry is controlled."

The department said also that its preliminary investigation indicates that certain trade associations not only disseminate production statistics but take steps to see that their members produce no more of the total supply than these statistics indicate has been their proportionate share. These steps, the department alleges, range from mass pressure on dissenting individuals during meetings of the association to actual boycott and retaliation.

Another device, it was said, is tied up with cost accounting. Advice on accountancy, it was alleged, is used to establish standard amounts to be charged as an expense for each operation regardless of its cost.

"Thus, a fixed and uniform differential for profit is established and

maintained by the careful policing of association personnel," it was stated.

It was further charged that sometimes these firms also enter into direct agreements for the restriction of productive machinery. Another device was said to be the creation of a fund among a small group to buy competing plants, "which are troublesome competitors." Upon acquisition, such plants, it was stated, are often shut down and dismantled. Men are thrown out of work, the statement adds, and independent capitalists of small cities interested in the development of a local industry are helpless either to anticipate or to take measures to prevent the destruction of that industry.

"This may mean the increase of local relief and tax burdens and the drying up of local initiative," the statement said.

The department took considerable pains to say it is not its intention to attack trade associations in themselves. It said they have many useful and legitimate functions and that it is essential to prevent their members from becoming victims of unlawful activities by management organizations.

## International Foundry Congress Meets in London

LONDON — Sir Frank Bowater, Lord Mayor of London, welcomed over 650 delegates and their wives at the International Foundry Congress, when it opened at the Dorchester Hotel, London, under the chairmanship of J. Hepworth, president of the Institute of British Foundrymen.

During the week of the Congress the delegates visited 11 foundries in London and 40 technical papers were presented and discussed. The week after the Congress visits were made to foundries in various parts of England and Scotland.

The Oliver Stubbs Medal, awarded annually for distinguished services to the institute, was presented to J. G. Pearce, director of the British Cast Iron Research Association; the E. J. Fox Medal, for distinguished foundry practice and science and distinguished metallurgy, to Dr. H. A. Schwartz, of Cleveland, Ohio; and the Meritorious Services Medal, for valuable work in institute administration, to J. E. Cooke, honorary secretary of the Lancashire branch of the institute for seven years.

The subject of the presidential address was the history of steel castings. Professor W. L. Bragg, director of the Cavendish Laboratory, Cambridge, delivered the Edward Williams Lecture, his subject being "The Atomic Pattern of Metals."

W. B. Lake was inducted as president of the institute for the ensuing year. Mr. Lake is one of the pioneers of electric steel manufacture in the United Kingdom.

## Peak of PWA Construction To Come at End of July

WASHINGTON — The Public Works Administration continued this week to speak highly of the PWA program in the wake of the new \$3,860,000,000 spending-lending effort by the Administration, announcing that the peak of construction will be reached at the end of July, that construction undertaken on projects had provided a total of 1,783,700,000 man-hours of direct employment at sites, and that \$591,000,000 worth of iron and steel products had been purchased. In addition, the PWA listed \$451,472,000 for machinery and \$90,000,000 for transportation equipment.

# THE NEWS IN BRIEF

**Machine Tool Builders** to hold first show since 1935 at Cleveland, Oct. 4 to 13.—Page 40.

**Ampco Metal, Inc.**, Milwaukee, celebrates 25 years of growth in which it has expanded from four employees to 115.—Page 41.

**Automobile industry** now actively engaged in preparatory work for 1940 models, production of which will start about July 15.—Page 44.

**Automobile output** gained last week, but may drop about 10,000 units this week.—Page 44.

**Merger of Chain Belt Co. and Baldwin-Duckworth Chain Corp.** to be voted on by stockholders on July 11.—Page 46.

**E. C. Barringer** asks aid of manufacturing plants in segregating steel scrap, particularly alloy bearing scrap.—Page 47.

**American Institute of Steel Construction** awards prizes for most beautiful bridges built during past year.—Page 47.

**President Roosevelt's** new spending-lending program characterized by some members of Congress as a frantic political document and by others as a necessary stimulant to business recovery.—Page 48.

**Government orders** for iron and steel products for week ended June 17 totaled \$520,002.—Page 50.

**The National Labor Relations Board's** decision permitting employers to petition for collective bargaining elections regarded as effort to head off Wagner Act revision.—Page 51.

**Senate Educational Labor Committee** reports favorably on amendment to Walsh-Healey Act, bringing contracts at \$4,000 and over under the law.—Page 52.

**Undistributed profits tax** repealed by Congress in revision of corporate tax bill.—Page 53.

**United States exports** of industrial machinery to North China are sharply increased.—Page 54.

**Freight cost** on steel distribution is part of cost, says Woodring.—Page 54.

**Moltrup Steel Products Co.** ordered by Labor Board to disband independent labor union.—Page 54.

**Secretary of War Woodring** rules that freight bill paid in distribution of steel is one of the elements of production.—Page 54.

**Value of cooperative effort** in market development and promotion stressed at meeting of Malleable Founders Society.—Page 55.

**Industrial Furnace Manufacturers Association** elects C. T. Holcroft, president.—Page 56.

**Building activity**, particularly in dwellings, has boosted sales of copper and brass products.—Page 56.

**Granite City Steel Co.** cuts wages 2 to 5 per cent in all except common labor group by agreement with CIO union.—Page 56.

**General Electric Co.** purchases General Laminated Products Co., New York.—Page 56.

**International Foundry Congress** meets in London.—Page 57.

**Control of trade associations** by management of engineering firms under fire by Department of Justice.—Page 57.

**Peak of PWA construction activity** to come at end of July.—Page 57.

**Inland Steel Co.** loses its appeal against procedure used by Labor Board in finding it guilty of unfair labor practices.—Page 61.

**Detroit mayor and council** at loggerheads over cast iron pipe award.—Page 61.

**Lobdell Car Wheel Co.** has purchased Nazel Engineering & Machine Co. and will make Nazel air hammer and slotter.—Page 61.

**American Manganese Steel** completes plant additions.—Page 62.

**General Electric** to reopen Bridgeville, Pa., plant.—Page 62.

**Arthur G. McKee & Co.**, issues booklet on plants it has built.—Page 62.

**NLRB orders** disbanding of workers' organization at plant of Automotive Maintenance Machinery Co., North Chicago, Ill.—Page 62.

**Monarch Machine Tool Co.** demonstrates the value of machine to 10,000 of its neighbors—farmers and business people—at Sydney, Ohio.—Page 63.

**Household equipment** sales showed gain in May.—Page 64.

**William B. Pollock Co.**, Youngstown, will be busy all summer on blast furnace work for Republic and Inland.—Page 64.

**Republic Steel Corp.** orders new gas butt weld furnace for its Youngstown tube mill to make pipe in 1/8 to 4 in. sizes.—Page 65.

**Detroit Gasket & Mfg. Co.** erecting new plant at Marine City, Mich., will manufacture new product.—Page 65.

**Portugal may buy** \$5,000,000 worth of railroad equipment from the United States.—Page 65.

**Fabricated structural steel** orders in May were largest of the year.—Page 65.

**Estimates of iron and steel carloadings** for third quarter 35 per cent over carloadings for same period of 1938.—Page 65.

**Forms for decennial census** prepared by U. S. Bureau.—Page 65.

**A new use for THE IRON AGE** scrap quotations found by General Motors Corp.—Page 80.

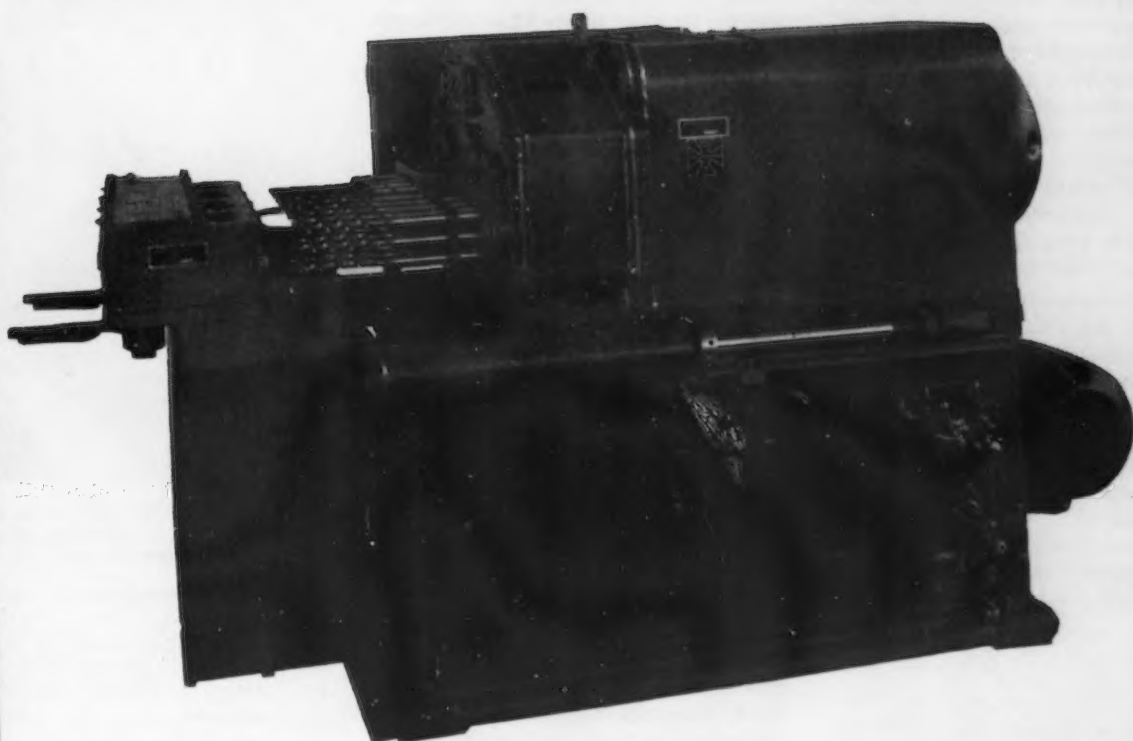
## SECTIONS INDEX

Personals .....	60
Obituary .....	61
Steel Ingot Production .....	67
Summary of the Week .....	68
Comparison of Prices .....	69
Pittsburgh, Chicago, Cleveland, Philadelphia and New York Markets .....	70
Scrap Market and Prices .....	74-75
Finished Iron & Steel .....	76-77
Pig Iron & Raw Material Prices ..	78
Warehouse Prices .....	79
Non-ferrous Market .....	81
Fabricated Steel .....	82
Plant Expansion & Equipment ..	84-85
Machine Tool Activity .....	86

## MEETINGS

July 10 to 15—American Society of Mechanical Engineers, San Francisco.
Aug. 28 to 31—American Mining Congress, Salt Lake City.
Sept. 20 to 22—National Industrial Advertisers Association, New York.
Sept. 26 to 29—Association of Iron and Steel Engineers, Pittsburgh.
Oct. 5 to 7—Society of Automotive Engineers, aircraft production meeting, Los Angeles.
Oct. 16—Society of Automotive Engineers, annual dinner, New York.
Oct. 23 to 27—National Metal Congress, Chicago.
Nov. 16 and 17—Porcelain Enamel Institute, New York.





## **PORTRAIT OF AN INVESTMENT**

No. 65-HH Baker single end machine having 20" width of ways, 40" length of saddle. Twin 3 $\frac{3}{4}$ " bore cylinder construction with 12" length of feed. Machine arranged with a #6 spindle multiple head and holding fixture for drilling bolt holes in main bearing caps of a popular low-priced car.

The purchase of machine tools should be regarded as an investment in profitable production. That is why the great industries whose buying is most efficient, have been Baker customers for many years.

If you are interested in lowering costs and increasing quality in drilling, boring, reaming or tapping operations, write or call Baker today. Send blueprints or sample parts for expert engineering recommendations.

**BAKER BROTHERS, INC., TOLEDO, OHIO**

New Jersey Office, 1060 Broad St., Newark

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# PERSONALS

E. W. SEEGER, heretofore in charge of the production engineering department of Cutler-Hammer, Inc., Milwaukee, has been appointed manager of the development department. He has been associated with the development of new apparatus and holds a number of patents on motor control apparatus. He joined the company in 1913 and has been engaged in various engineering activities of the company.

P. B. HARWOOD, who has been identified with the company for over 20 years, has been made manager of the engineering department. After serving in that department early in his career, he was made assistant supervisor in charge of steel mill control, then general supervisor in charge of engineering. Following this, he was made assistant in charge of the production engineering department, a position he held until his recent appointment.

REED R. SMITH has been appointed district sales manager of Pittsburgh Steel Co.'s New York office territory. He formerly was a representative in this territory. He will work under JOSEPH A. VOELKER, district sales manager.

GEORGE E. CLIFFORD, who has been Republic Steel Corp. district sales manager in the Los Angeles district office, has been placed in charge of the consolidated sales organization of Union Drawn Steel Division, Los Angeles, with the Los Angeles district sales office of Republic.

ARTHUR C. GELDNER, formerly district sales manager for the Union Drawn Steel Division, is now assistant district sales manager of the combined organization.

RALPH H. PAULEY has been elected president, Pittsburgh Tool Steel Wire Co., Monaca, Pa., succeeding the late Dr. Alfred Stengel. Mr. Pauley has served as secretary, then secretary-treasurer, and, for the past several years, vice-president and treasurer in active charge of the company's affairs. In addition to his duties as president, Mr. Pauley retains the office of treasurer. He is a member of the American Iron and Steel Institute, American Society for Metals, National Association of Manufacturers, Pennsyl-

vania State Chamber of Commerce, and the Beaver County Manufacturers' Association, of which he has long been a director and at one time president.

NORMAN A. EVANS has been appointed sales manager of the Pressed Steel Tank Co., Milwaukee. He has been a member of the company's sales force since 1931. After completing his education in engineering, he was engaged in manufacturing, design and sales engineering work for over four years. For the past three years he has been in charge of the Eastern territory with headquarters in New York.

EDWIN J. MOHR, manager of plant operations for the Symington-Gould Corp., Rochester, N. Y., has retired because of ill health, after nearly 30 years of service with the company and its predecessors. The former assistant managers of plant operations, W. H. HARTWIG, at Rochester, and D. P. MURPHY, at Depew, have been appointed production managers of the two plants respectively.

ROLLAND C. ALLEN, executive vice-president, Oglebay-Norton Co., Cleveland, has received the honorary degree of Doctor of Engineering from Rensselaer Polytechnic Institute, Troy, N. Y.

WILLIAM H. HARMAN and WILLIAM H. WINTERROWD, vice-presidents in charge of sales and operations, respectively of Baldwin Locomotive Works, have been elected directors.

DR. STEVEN P. TIMOSHENKO, professor of mechanics at Stanford University, has been awarded the Lamme Medal for 1938 by the Society for the Promotion of Engineering Education. The medal was founded to honor the memory of B. G. Lamme, who at his death in 1924 was chief engineer of the Westinghouse Electric & Mfg. Co.

JAMES McEVoy, general attorney for General Motors Corp., has been elected president of the Detroit Board of Commerce for his third consecutive term. FRED C. MATTHEAI, president of the American Metal Products Co., was elected a director for one year to fill the vacancy caused by the election



E. W. SEEGER, manager of the development department of Cutler-Hammer, Inc.

of Mr. McEvoy as president. McEvoy was elected a director recently for a two-year term but cannot serve on the board while he is president.

HAROLD M. MOOCK, of the Moock Electric Supply Co., Canton, Ohio, has been elected president of the Westinghouse Agent-Jobbers' Association. Other officers are RALPH KELLY, vice-president Westinghouse Electric & Mfg. Co., vice-president; CLAUDE W. JOHNSON, Johnson Electric Supply Co., Cincinnati, secretary; and L. B. BURNS, Westinghouse Merchandising Division, Mansfield, Ohio, treasurer and assistant secretary.

D. W. HUFF, who has been engaged in sales work since 1919, first in the mill supply business and later as a sales agent, has been appointed general sales manager of the Thomas Laughlin Co., Portland, Me.

PROF. ALEXANDER GRAHAM CHRISTIE, of the Johns Hopkins University, and president of the American Society of Mechanical Engineers, had the honorary degree of Doctor of Engineering bestowed on him June 10 by Stevens Institute of Technology.

RICHARD P. BROWN, chairman of the board of the Brown Instrument Co., Philadelphia, and vice-president





**P. B. HARWOOD**, new manager of the engineering department of Cutler-Hammer, Inc.

of the Minneapolis-Honeywell Regulator Co., has been appointed first Secretary of the new Department of Commerce of the Commonwealth of Pennsylvania by Gov. Arthur H. James.

♦ ♦ ♦

**JOSEPH GRACE**, formerly with Lempco Products, Inc., has been appointed sales representative in Kansas, Missouri, and part of Oklahoma and Arkansas by Maremont Automotive Products, Inc., Chicago. **EDWARD BOXER**, formerly with Eaton Products, takes over New Jersey, Delaware and part of Pennsylvania; and **RICHARD PRICE**, formerly with W. D. Foreman Co., will represent the Maremont company in the Chicago area.

♦ ♦ ♦

**HARRY NEAL BAUM**, advertising manager, Fairbanks, Morse & Co., has been elected president of the Engineering Advertisers Association of Chicago, succeeding **H. H. SIMMONS**, advertising manager of the Crane Co. Other officers are: **E. A. GEBHARDT**, Commercial Advertising Agency, **FREDERIC I. LACKENS**, Hays Corp., Michigan City, Ind., and **R. A. PETERSON**, Davis Regulator Co., vice-presidents, and **JOHN J. ROWELL**, Guardian Electric Co., who was reelected secretary and treasurer.

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**A. M. DUDLEY**, patent department engineer, Westinghouse Electric & Mfg. Co., has been awarded a doctor's degree in engineering by the University of Michigan. He had been as-

sociated with Westinghouse for 35 years and is well known for his work in designing alternating current motors, starting, lighting and ignition systems for automobiles, and applications of electrical equipment in the marine field.

### Detroit Officials Differ Over Cast Iron Pipe Order

**DETROIT**—The Common Council and Mayor Richard Reading are at loggerheads over a contract for cast iron water pipe on which a French concern was the low bidder. The council met with a veto from the mayor in its attempt to compromise by giving two-thirds of an award of 10,000 ft. of 6-in. and 20,000 ft. of 8-in. pipe to the Pont-A-Mousson Co. of Nancy, France. Mayor Reading rebuked the council, saying that it had not lived up to the Charter and that its action did not encourage competitive bidding. The mayor also pointed out in his veto that many Detroit concerns depended on selling their goods to foreign countries. The council president, **Edward J. Jeffries, Jr.**, declared that the manager of the Water Board and the Department of Purchases and Supplies had recommended that part of the business be awarded to an American bidder to insure quicker delivery. The American concern was the Lynchburg Foundry Co., Lynchburg, Va.

### Lobdell Car Wheel Co. Buys Nazel Engineering

**THE Lobdell Car Wheel Co.**, Wilmington, Del., has purchased the business of the Nazel Engineering & Machine Works, Philadelphia, manufacturer of the Nazel air hammer and dill slotter. The Lobdell company, which was established in 1836, has been engaged in the manufacture of paper-making machinery as well as car wheels. The Nazel business was established by John Nazel in 1900. The manufacture of Nazel products will be under the supervision of Howard W. Wimer, who has been associated with the Nazel business for 35 years.

### Inland Steel Loses Appeal Against NLRB Procedure

**CHICAGO**—The complaint of the Inland Steel Co. against the procedure used by the NLRB in finding it guilty of unfair labor practices was

dismissed last week by the United States Circuit Court of Appeals. The court found that the Labor Board had conducted a fair and full hearing on the case and that it was unnecessary for the board to answer a number of questions on procedure filed by Inland's attorneys. A formal appeal from the board's order to break up the independent union at Inland's Indiana Harbor plant, and to bargain collectively with the SWOC still is pending in the court.

### ... OBITUARY ...

**O. R. JONES**, retired electrical engineer of the Sharon Steel Hoop Co., died in Youngstown, June 18, following several weeks' illness, at the age of 75. He spent 12 years with Youngstown Sheet & Tube Co. before joining Sharon Steel Hoop Co., where he was employed 24 years. He retired three years ago.

Mr. Jones was past president of the Association of Steel and Iron Engineers.

♦ ♦ ♦

**FRANK E. CAMPBELL**, superintendent of lighting construction for the Detroit Public Lighting Commission, was buried June 24 at Detroit. Mr. Campbell, who was 63 years old, died of a heart attack. Born in Kansas City, Mo., he went to Detroit and became an employee of the commission 44 years ago. He was a member of the Detroit Engineering Society and was credited with much of the city's progress in lighting.

### French Steel Output Highest for Eight Years

**LONDON**—France's steel production in May reached the highest monthly total for more than eight years at 706,000 tons, compared with 625,000 tons in April, and 501,000 tons in May, 1938.

The average monthly output last year was 515,000 tons, whereas for the first five months of 1939 the monthly average is 632,000 tons.

French pig iron production in May showed a corresponding increase, the output being 681,000 tons, against 603,000 tons in April and 483,000 tons in the corresponding month of 1938.

The French Price Control Commission has sanctioned an increase in the price of steel products for the domestic market of an average of 7 per cent. This is effective immediately.

# Electro-Platers Meet at Asbury Park

(CONCLUDED FROM PAGE 39)

for Efficient Plating Plant Layout" by D. R. Hartshorn, Jr., chemist, Westinghouse Electric and Mfg. Co., Springfield, Mass. The author discussed the building requirements, the consideration of high speed automatic equipment, the need for good light, the proper design and placement of drains to the sewers, the importance of proper floor construction, and adequate ventilation.

The session held on the morning of Thursday, June 22, was presided over by Ralph J. Liguori, president of the New York branch.

Dr. C. B. F. Young, consulting engineer of New York, spoke on "The Effect of Certain Wetting Agents upon Nickel Deposits."

"A Summary of Activities on Electro Deposition at the National Bureau of Standards," was presented by Dr. William Blum, head of the Division of Electrochemistry.

The paper on "Porosity Tests for Nickel Coatings on Steel" by P. W. C. Strausser, formerly research associate of the American Electro-Platers Society at the National Bureau of

Standards, was presented by Dr. Blum.

Dr. Blum also presented a paper written by M. R. Thompson, chemist, National Bureau of Standards, on "The Measurement of pH in Alkaline Plating Solutions." The paper discussed only the methods of measurement.

"Dropping Tests for Zinc and Cadmium on Steel" was a paper read by A. Brenner, chemist, National Bureau of Standards. Mr. Brenner mentioned the important point that in all such work careful sampling is as necessary as careful testing.

C. Kasper presented a paper entitled "Some Effects of Anode Shape and Position on Cathode Current Distribution." The author's approach was mathematical and demonstrated among other things that the effect of anode shape on current distribution decreases with the increase of distance from the cathode.

A. J. Dornblatt presented a paper on "A Study of Silver Plate for Industrial Applications" written by C. W. Lowe and A. C. Simon of the metallurgical division of the National Bureau of Standards.

## American Manganese Steel Completes Plant Additions

THE American Manganese Steel division of the American Brake Shoe & Foundry Co. has completed extensive additions at its Chicago Heights, Ill., plant. Six factory additions and a new administration building were included in the program. Plant additions include employees welfare building, foundry addition, new pattern storage building, new heating plant, machine shop addition and a shipping room addition.

## Magnesium the "Flyweight Structural Material"

(CONCLUDED FROM PAGE 43)

the United States and in England on the addition of silver to magnesium alloys seem to show promise. The silver contents which are most effective in raising the tensile and yield strengths range from 2 to 5 per cent, giving ultimate strengths of more than

60,000 lb. per sq. in. and yield strengths of 50,000 lb.

The resistance to corrosion of magnesium alloys should also show improvement under the stimulus of continued research and investigation. Magnesium has joined the company of "moderns" as a high purity metal (99.8-99.938 per cent). High purity alloys free from small amounts of iron, nickel, copper, etc., show much better resistance to sea water. Alloys containing zinc also show the same characteristic. The surface treatments, like the chrome pickle, etc., provide an inhibitory film, and together with paint coatings, form excellent protectors. Lastly, the very large recent improvements in the adhesiveness and durability of paint coatings have provided much greater protection for the bare metal.

Possibly one of the most important future consumers of magnesium alloys is the airplane propeller. It is widely believed that magnesium propellers, because of their light weight and satisfactory physical properties will become increasingly popular.

There is sufficient interest among the airplane builders to be able to look forward to their much broader use. Whether this will come through forgings made from new age-hardening alloys, or through other improvements, such as surface rolling of propellers, for example, to prevent reductions in their strength by corrosion and other factors, cannot be predicted at this time. But in one way or another, magnesium is due for progressively increasing attention.

## General Electric to Reopen Bridgeville, Pa., Plant

PITTSBURGH—General Electric Co. is expected to reopen its Bridgeville, Pa., plant near here soon, giving work to 50 or 60 employees. The plant, which manufactured glass tubing, has been closed for the past several years. Former employees will be given preference when the plant opens.

## NLRB Rules Against Workers' Organization

WASHINGTON—Striking again at independent unions, the National Labor Relations Board has ordered the Automotive Maintenance Machinery Co., North Chicago, to "disestablish" the Ammco Workers Organization and to reinstate with back pay three employees discharged for alleged union activity. At the same time the board dismissed charges of repeated refusals to bargain collectively with the Amalgamated Association of Iron, Steel and Tin Workers of N. A., SWOC affiliate. The board said the charges were dismissed because the evidence did not show that the Amalgamated represented a majority of employees in the unit found appropriate by the board. The board also dismissed charges that two employees had been discharged because of their Amalgamated membership.

## McKee Issues Booklet On Plants It Has Built

ARTHUR G. MCKEE & CO., Cleveland engineers and contractors, have issued a large size book picturing domestic and foreign plants designed or constructed for the most part during the past six or seven years. Approximately 50 pages of large size photos are contained in the catalog, followed by 53 pages of advertisements by equipment suppliers.



# Monarch Machine Tool Co. Explains The Machine to 10,000 Visitors

**S**IDNEY, Ohio—Seldom if ever has any section of the nation been enlightened about machine tools as were the farmers, small business men, housewives and children who visited the Monarch Machine Tool Co. plant here June 24 and 25.

Some 10,000 visitors from this small city and surrounding southwestern Ohio, including local storekeepers who rarely leave their shops on a busy Saturday afternoon, inspected the new office building and factory additions, and departed with much broader understanding of how machine tools affect their daily lives, this insight being gained through a well executed display of ordinary customer products.

Viewing modern methods and products contrasted with their ancient predecessors, it was virtually impossible for any to miss the fact that benefits of the machine have been immeasurable.

## Welcomed By Officials

In the new main lobby, where they were welcomed by W. E. Whipp, Monarch president, and by other company officials, visitors found a large permanent inscription, "Machine tools are the foundation of modern civilization. They serve to enrich human life."

Conducted to a large display room housing the educational exhibits, visitors were attracted first to a large revolving globe with the basic machine tools illustrated and one of the several panels explaining that "Deprived of machine tools, men are cheap and goods expensive."

Around the room were scores of every-day products that the visitors knew well. "Where efficient machine tools are scarce, women's drudgery increases," pointed out one caption. "Machine tools contribute to give us more farm produce at less cost by making possible efficient farm equipment," said another.

"These are better products at a lower cost, thus increasing demand and giving employment to tens of thousands instead of hundreds," explained another caption. Items displayed in all exhibits were closely keyed to captions by colored ribbons.

One of the local 10-cent stores contributed inexpensive pins and similar items. For contrast with modern utensils, a Sidney firm searched for and produced several old cast iron pots,

at one time found only in the homes of the privileged few. A jeweler loaned a pair of 120-year-old eyeglasses and dug up the story of their manufacture by hand. Several machine tool manufacturers cooperated with Monarch by loaning photographs and machined parts. Drawings of THE IRON AGE, used in its series, were on display.

The story of food merchandising—how canned goods, milk bottles and packages are machine made and contribute to human happiness—was there. A modern bedroom exhibit pointed out that the Roman emperor pictured on the wall never dreamed of having bedsprings, a fan, radio or other conveniences.

Displays also were built around the progress of the electric light, electric household appliances and the electric motor.

The spectators seemed to find the

exhibition very absorbing. "Look at that original Hoover vacuum sweeper," said one woman to a neighbor. "How heavy and clumsy it was. We owe a lot to machine tools I guess."

How machine tools produce parts so accurately that they are interchangeable; how improved home building materials, autos, shoes, cameras, golf clubs and electric razors have been developed were other links in the general theme. "Everything sold at the newsstand is made by machines," it was also brought out.

After receiving a copy of the National Machine Tool Builders' Association's booklet "Machine Tools and You" visitors were directed to the shops. Small name cards at every employee's station, bench or desk made their location easy, and imparted pride of participation among employees.

Many of the visitors recalled how 30 years ago the company began in a shed with 25 men. Today it employs 570 and occupies 133,897 sq. ft. During the past five years its employment has more than doubled.

The newest building is air conditioned and unusually well lighted. In

**G**RINDING an intricate form on soft, semi-sintered pieces of the Carboloy preparatory to final sintering. Equipment in this Forming Department of the new Carboloy plant at Detroit is designed to handle blanks ranging from thin delicate parts such as small solid Carboloy saws to cylindrical blanks several inches in diameter. The wear-resistant part shown in this photograph is used in household garbage disposal units.



addition to doubling the final assembly department and quadrupling the design and engineering departments, the building will provide new offices for all management personnel, an auditorium seating 500, a cafeteria and employees' lounge room, new quarters for apprentice training, a photographic laboratory, blueprint room and a large display and demonstration room.

The auditorium, cafeteria and other quarters are very well equipped. In the factory, besides the additional space provided for the erecting floor, inside loading of railroad cars is now provided. Nearby, a new downdraft spraying installation has been completed.

## May Steel Exports Dropped 4 Per Cent

**D**ROPPING 4 per cent, May exports of iron and steel totaled 147,760 gross compared with 153,884 tons in April. For the first five months of the present year foreign shipments declined to 733,307 tons from 967,397 tons in the corresponding period of 1938. The principal country of export in May was Canada. Shipments going to that country amounted to 18,893 tons, made up chiefly of non-alloy black steel sheets, plain structural shapes and non-alloy cold-rolled strip. Sweden was second, taking 12,870 tons, consisting mostly of non-alloy plates and pig iron. Next came Japan, which took 12,432 tons, the principal products being ingots and car axles.

Reflecting a sharp upturn, May exports of scrap rose to 384,881 tons, compared with 240,124 tons in April. For the 1939 five-month period scrap exports decreased to 1,390,064 tons, compared with 1,636,247 tons in the corresponding period of last year. As usual, Japan was the heaviest purchaser of scrap in May, taking 196,686 tons. Shipments to the United Kingdom were 60,798 tons. Italy took 48,007 tons.

## William B. Pollock Co. To Be Busy All Summer

**Y**OUNGSTOWN — Operations at the William B. Pollock Co. plant here are expected to remain steady this summer due to the recently received contract for rebuilding Republic Steel Corp.'s blast furnace at Warren, and also the fabricating award for the Inland Steel Co. furnace at Indiana Harbor, Ind., which will be reconstructed.

## REINFORCING STEEL

... Awards of 17,125 tons; 10,850 tons in new projects.

### ATLANTIC STATES AWARDS

- 9000 Tons, Washington, Federal office building, to Sweets Steel Co., Williamsport, Pa., through McCloskey & Co., Philadelphia.
- 1300 Tons, Buffalo, plant addition for General Mills, Inc., Washburn Crosby division, to Bethlehem Steel Co., Bethlehem, Pa., through Charles H. Wing Co., contractor.
- 850 Tons, Johnstown, Pa., Conemaugh River flood control, to Bethlehem Steel Co., through Al Johnson Construction Co., contractor.
- 400 Tons, Washington, extension to steam distribution system, to Truscon Steel Co., Youngstown, through T. M. Flanagan, Reading, Pa., contractor.
- 250 Tons, Queens and Nassau Counties, N. Y., Cross Island Parkway, to Jones & Laughlin Steel Corp., Pittsburgh, through Tully & DiNapoli, contractors.
- 218 Tons, Springfield, Mass., dike, to C. C. Lewis Co., Springfield, Mass.
- 207 Tons, Fulton and Huntingdon Counties, Pa., sections 16A and 17, Pennsylvania Turnpike Commission, to Bethlehem Steel Co., through L. M. Hutchinson, Mt. Union, Pa., contractor.
- 200 Tons, Epping, N. H., road, to Bancroft & Martin Rolling Mill, Portland, Me., through Lane Construction Co., Meriden, Conn., contractor.
- 110 Tons, Everett-Chelsea, Mass., north metropolitan relief sewer, to Bethlehem Steel Co., Bethlehem, Pa.
- 100 Tons, Thompson, Conn., bridge, to Truscon Steel Co.; Arute Bros., Inc., New Haven, Conn., contractor.

### CENTRAL AND WESTERN STATES

- 970 Tons, Pollock, Cal., Central Valley project (Invitation 33208-A-1), to Columbia Steel Co., San Francisco.
- 693 Tons, Albany, Cal., regional laboratory for Department of Agriculture, to Truscon Steel Co., San Francisco; through MacDonald & Kahn, San Francisco, contractors.
- 460 Tons, Buena, Wash., Yakima project (Invitation 33868-A-1), to Bethlehem Steel Co., San Francisco.
- 400 Tons, Owensboro, Ky., river intake, to Truscon Steel Co., Youngstown.
- 375 Tons, Anchorage, Alaska, post office and court house, to Ceco Steel Products Co., Omaha, Neb., through McCarthy Brothers Construction Co., St. Louis, contractor.
- 325 Tons, Byron, Ill., bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 250 Tons, Chicago, viaduct, 33rd and Western Avenue, to Calumet Steel Co., Chicago.
- 205 Tons, Boulder City, Nev., Boulder Canyon (Invitation D-23038-A), to Columbia Steel Co., San Francisco.
- 200 Tons, Minneapolis, men's union building, to Bethlehem Steel Co., Bethlehem, Pa.
- 150 Tons, Wausau, Wis., sewage treatment plant, to Concrete Steel Co., Chicago.
- 140 Tons, Winfield, Kan., bridge to Sheffield Steel Corp., Kansas City.
- 113 Tons, Pasadena, Cal., Avenue 43, bridge over Arroyo Seco, to Consolidated Steel Co., Los Angeles, through Contracting Engineers, Los Angeles, contractors.
- 110 Tons, Davenport, Iowa, school, to Bethlehem Steel Co., Bethlehem, Pa.
- 100 Tons, Clarksville, Mo., lock No. 4, to Laclede Steel Co., St. Louis.

### PENDING REINFORCING BAR PROJECTS ATLANTIC STATES

- 1500 Tons, Charlestown, Mass., housing project.
- 1014 Tons, Franklin Falls, N. H., dam.
- 600 Tons, Orange County, N. Y., highway project R.C. 4027; West Shore Concrete Co., Suffern, N. Y., low bidder (previously reported).
- 480 Tons, Franklin County, Pa., section 18, Pennsylvania Turnpike Commission; C. J. Langfeiter, Rosedale, Md., contractor.
- 400 Tons, Warren County, N. Y., mostly mesh, highway project R.C. 4023; Louis taken until July 19.
- 300 Tons, Knightsville Dam, Mass., for U. S. Engineers, Providence, R. I.; bids June 24.
- 290 Tons, Bedford County, Pa., section 13-D, Pennsylvania Turnpike.
- 270 Tons, Hamilton, County, N. Y., mostly mesh, highway project R.C. 4023; Louis Mayersohn, Albany, N. Y., low bidder (previously reported).
- 250 Tons, Queens, N. Y., Southern Parkway, S-39-39-2.

- 230 Tons, Suffolk County, N. Y., highway project S.S.P. 39-3; Good Roads Engineering & Construction Co., Wantagh, N. Y., low bidder (previously reported).
- 150 Tons, Cambridge, Mass., Massachusetts Institute of Technology swimming pool.
- 125 Tons, Bangor, Me., two schools.
- 107 Tons, Erie and Niagara Counties, N. Y., highway project R.C. 4045.
- 100 Tons, Surry, N. H., dam.

### CENTRAL AND WESTERN STATES

- 1955 Tons, Memphis, Tenn., housing project, S. & W. Construction Co., Memphis, general contractors.
- 1000 Tons, Panama Canal, Schedule 3492; bids June 29.
- 681 Tons, San Francisco, Outer Mission Junior High School; Anderson & Ringrose, San Francisco, low bidders.
- 600 Tons, Waterloo, Iowa; sewage disposal plant, Dobson-Robinson Co., Lincoln, Neb., general contractor.
- 405 Tons, Calexico, Cal., power plant at drop No. 3, All-American Canal; bids July 18.
- 400 Tons, Decatur, Ill., grain storage, Central Soyol Co.
- 270 Tons, Cleveland, Central High School, East 40th Street.
- 256 Tons, San Francisco Coast Guard air station; William Wills, Seattle, low bidder.
- 200 Tons, Chicago, Rival Packing Co.
- 130 Tons, Cleveland, Halle Brothers garage; bids in.
- 113 Tons, Cleveland, Kentucky School; bids June 29.
- 110 Tons, San Francisco, joint highway district No. 10; bids June 30.

## Household Equipment Sales And Shipments Gain

An increase of 14.9 per cent in May electrical vacuum cleaner sales is reported by the Vacuum Cleaner Manufacturers' Association, Cleveland. Sales totaled 114,377 units, compared to 99,542 a year ago. May was the seventh consecutive month, with one exception, to show an increase over the same period a year before.

\* \* \*

For the seventh consecutive month, factory shipments of household washers in May showed an increase over the corresponding month a year before, totaling 105,266, compared to 84,016 in May, 1938, according to figures reported by the American Washer and Ironer Manufacturers' Association. This was an increase of 25.29 per cent.

## National Metal Congress Has Large Reservations

**A**CCORDING to William H. Eisenman, secretary of the American Society for Metals and managing director of the National Metal Congress and Exposition, which will be held this year in Chicago commencing Oct. 23, space for this year's Congress is 95 per cent reserved.

New York and vicinity head the reservation list with 35 exhibitors; Chicago area is second with 35 and 18 Ohio companies bring the Buckeye state to third place. Other areas ranking in their order as regards exhibitors are New England, Pittsburgh, Philadelphia, Michigan and Milwaukee respectively.



# Fabricated Structural Steel Orders in May Largest of the Year

NEW orders for fabricated structural steel booked during May were the largest for any month this year, according to reports received by the American Institute of Steel Construction, amounting to 156,207 tons. For the first five months of the year the new orders total 553,252 tons in comparison with 390,201 booked during the same five months of last year. Shipments for the five months of 1939 total 532,633 tons, and the backlog amounts to 502,119 tons, thus indicating a consistent improvement in volume for this year.

The new business booked by this industry during the first five months of 1939 is 49.6 per cent of the average total bookings for the first five months of the years 1923-1925, both inclusive, (5/12 of 2,675,000 tons) which were compiled by the U.S. Department of Commerce. The 1923-1925 base is used for comparison with the charts "Construction Contracts Awarded"

currently appearing in the monthly Survey of Current Business published by the Bureau of Foreign and Domestic Commerce of the U.S. Department of Commerce, which are based on the index, 1923-1925 equals 100.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry, 1939	Estimated Total Tonnage for the Entire Industry, 1938
<b>CONTRACTS CLOSED</b>		
January .....	101,712	80,320
February .....	82,719	57,144
March .....	95,065	84,257
April .....	117,549	91,158
May .....	156,207	77,322
Totals .....	553,252	390,201
<b>SHIPMENTS</b>		
January .....	84,281	87,768
February .....	84,412	81,161
March .....	125,259	103,300
April .....	118,228	100,038
May .....	120,453	96,439
Totals .....	532,633	468,701
Tonnage available for future fabrication—502,119.		

## Iron and Steel Carloading Estimates for Third Quarter 35% Over Same 1938 Period

PITTSBURGH — Iron and steel carloadings in the Pittsburgh and nearby areas are expected to register an increase of 35 per cent during the third quarter this year over the same period in 1938, according to the Allegheny Regional Advisory Board, an organization which makes quarterly estimates and which has established a reputation for its accuracy in gaging the trend.

According to a report submitted by Clem W. Gottschalk, chairman of the iron and steel committee of the Advisory Board and assistant traffic manager Jones & Laughlin Steel Corp., actual iron and steel carloadings in the area covered by the board for the third quarter of 1938 were 106,428, while estimated carloadings for the third quarter this year are 143,678. The improvement is predicated on the belief that steel production during the third quarter is expected to increase moderately with a peak of about 60 per cent looked for during July and August.

Mr. Gottschalk's report also states that 129 merchant ships, aggregating 631,850 gross tons, were under construction June 1, which represents, the

report added, an increase over a year ago when there were 119 vessels, with an aggregate gross tonnage of 464,095 tons, under construction.

The Advisory Board's report estimates an increase of 17.3 per cent in all carloadings during the third quarter of this year over the same quarter in 1938.

## Detroit Gasket & Mfg. Co. To Make New Product

THE Detroit Gasket & Mfg. Co. is erecting a plant at Marine City, Mich., to begin manufacture within 30 days of a new product, according to Lloyd H. Diehl, company president. The type of product has not been announced.

## Forms for Decennial Census Prepared by U. S. Bureau

WASHINGTON — Schedule forms for use in practically all fields of inquiry for the forthcoming sixteenth decennial census have been formulated and soon will be submitted to Secretary of Commerce Harry L. Hopkins for final approval, according to William L. Austin, Director, Bureau of the Census. General advisory committees representing various segments of American life, smaller and

more specialized groups, and officers of various governmental agencies have cooperated with the Census Bureau in the formulation of the schedules for the census to be taken next April. Many questions suggested by various sources for inclusion on the schedules had to be omitted so that the decennial census information could be collected, tabulated and published within the required period of three years, Mr. Austin said.

## Republic Orders New Unit For Youngstown Tube Mill

YOUNGSTOWN—Republic Steel Corp. has awarded contracts for the construction of a new Fretz-Moon continuous gas butt weld furnace at its tube plant here. Pipe 1/8 in. to 4 in. in diameter will be produced in lengths up to 150 ft. The company thus will have gas weld butt, common butt, lap weld and electric weld pipe production here.

## Portugal May Buy \$5,000,000 Worth of Railroad Equipment in U. S.

WASHINGTON—Railroad companies of Portugal are contemplating the purchase of approximately \$5,000,000 of new rolling stock to replace the very old equipment now in use, according to a report from the American Consulate at Lisbon made public by the Department of Commerce. These purchases probably will be for delivery by May, 1940, the date set for the opening of the centennial celebration in Portugal. The report said the probability that orders will be placed for American equipment is good since representatives of the Portuguese railroads have visited the United States and followed an itinerary of inspection arranged for them by the department's transportation division. A representative of American manufacturers of railway equipment who has since visited Portugal in connection with the contemplated purchases said upon his return that the local railways are giving much consideration to placing the orders in the United States. However, it was pointed out that agents of European manufacturers resident in Portugal have a decided advantage in that market in the bidding since bids are usually open for submission for a period of only 15 to 20 days.

Ajax Steel & Forge Co., 205 Adair Street, Detroit, has appointed Jackson-Alden Associates, Lincoln-Liberty Building, Philadelphia, as its representative in eastern Pennsylvania, eastern New York State, New Jersey, Delaware, Maryland, and Washington.

# Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources

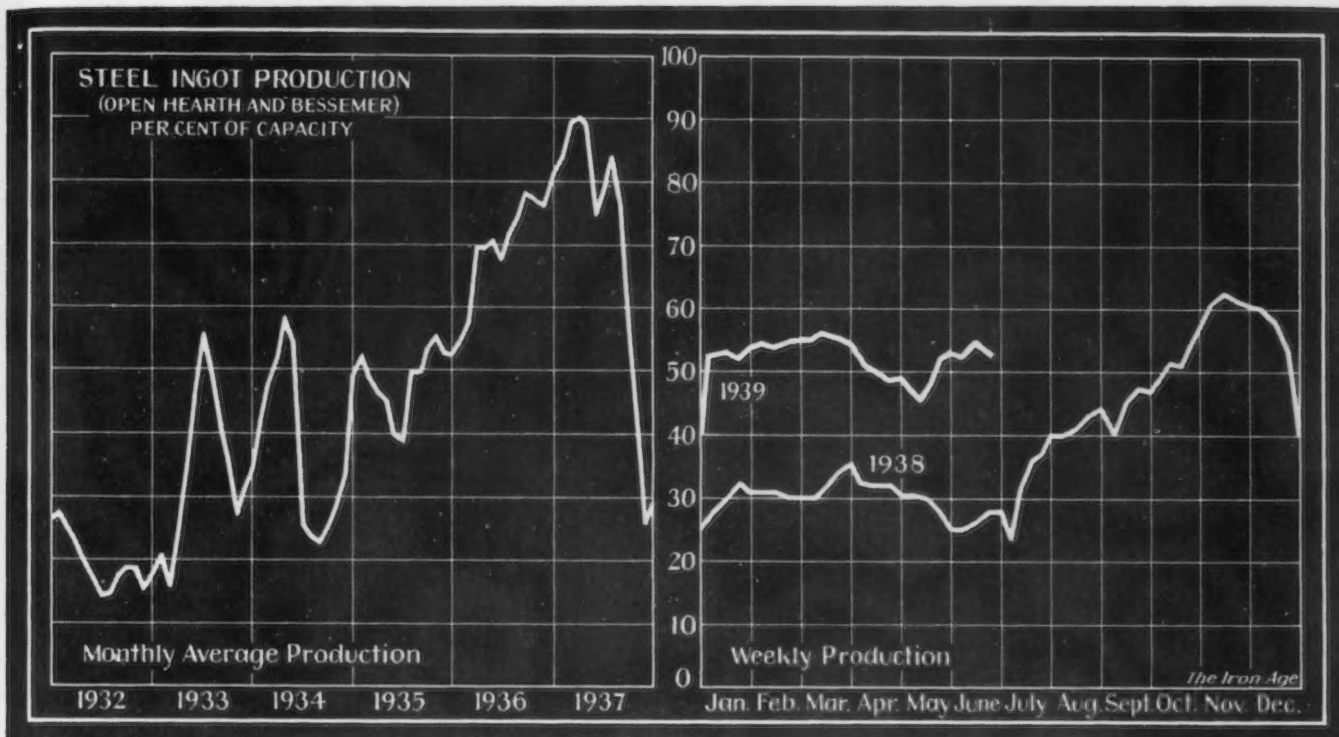
	May 1939	April 1939	March 1939	April 1938	Four Months 1939	Four Months 1938
<b>Steel Ingots: (gross tons)</b>						
Monthly output <sup>a</sup> .....	2,917,876	2,986,985	3,396,021	1,925,166	12,491,670	7,354,863
Average weekly output <sup>a</sup> .....	658,663	696,267	766,596	448,757	728,377	428,855
Per cent of capacity <sup>a</sup> .....	48.24	50.99	56.14	33.44	53.35	31.29
<b>Pig Iron: (gross tons)</b>						
Monthly output <sup>b</sup> .....	1,717,516	2,056,177	2,394,615	1,376,141	8,686,402	5,555,981
<b>Raw Materials:</b>						
Coke output <sup>c</sup> (net tons) .....	2,421,235	2,934,560	3,507,237	2,510,964	13,034,807	10,761,095
Lake Ore consumed <sup>d</sup> (gross tons) ..	2,245,513	2,799,769	3,316,691	1,853,658	11,895,706	7,533,481
<b>Castings: (net tons)</b>						
Malleable, orders <sup>e</sup> .....		29,183	35,997	19,724	136,519	76,913
Steel, orders <sup>e</sup> .....		34,100	41,367	21,869	147,851	110,015
<b>Finished Steel: (net tons)</b>						
Trackwork shipments <sup>a</sup> .....	6,658	6,819	6,481	4,150	20,459	15,121
Fabricated shape orders <sup>f</sup> .....	156,207	117,549	95,065	91,158	397,045	312,879
Fabricated plate orders <sup>g</sup> .....	34,036	35,844	29,784	21,958	109,042	101,259
U. S. Steel Corp. shipments <sup>h</sup> .....	723,165	701,459	767,910	501,972	2,936,668	2,067,216
<b>Fabricated Products:</b>						
Automobile production <sup>i</sup> .....	296,000*	359,200*	371,940	238,129	1,409,839*	906,475
Steel furniture shipments <sup>a</sup> .....		1,706,642	\$1,886†	\$1,444†	7,179,945	\$6,933†
Steel boiler orders <sup>e</sup> (sq. ft.) .....	877,117	764,996	616,682	474,931	3,329,637	2,150,838
Locomotives ordered <sup>j</sup> .....	51	19	63	3	93	39
Freight cars ordered <sup>j</sup> .....	2,051	2,695	1,000	3	5,702	819
Machine tool index <sup>k</sup> .....	219.8	155.6	185.4	90.3	91.0†	169.4†
Foundry equipment index <sup>k</sup> .....	108.8	146.0	146.6	79.3	142.8†	94.9†
<b>Non-Ferrous Metals: (net tons, U. S. only)</b>						
Lead shipments <sup>l</sup> .....		37,903	40,871	25,952	153,384	122,062
Lead stocks <sup>l</sup> .....		123,394	122,035	156,715		
Zinc shipments <sup>m</sup> .....	39,354	40,641	45,291	20,806	168,399	101,362
Zinc stocks <sup>m</sup> .....	126,769	130,380	127,985	135,238		
Tin deliveries <sup>n</sup> (gross tons) .....	5,905	5,980	4,755	5,980	19,170	18,270
Refined copper deliveries <sup>o</sup> .....	58,630	46,667	55,025	42,871	216,454	150,434
Refined copper stocks <sup>o</sup> .....	342,419	332,513	320,812	355,663		
<b>Exports: (gross tons)</b>						
Total iron and steel <sup>p</sup> .....		394,008	474,360	489,249	1,590,730	2,063,016
All rolled and finished steel <sup>p</sup> .....		134,478	145,164	115,944	134,478	507,706
Semi-finished steel <sup>p</sup> .....		8,849	9,485	13,355	8,849	114,914
Scrap <sup>p</sup> .....		237,691	310,223	306,900	996,052	1,253,050
<b>Imports: (gross tons)</b>						
Total iron and steel <sup>p</sup> .....		44,083	25,369	21,237	116,265	82,284
Pig iron <sup>p</sup> .....		3,512	3,658	3,823	8,359	17,670
All rolled and finished steel <sup>p</sup> .....		32,587	14,102	12,475	75,453	52,953
<b>British Production: (gross tons)</b>						
Pig iron <sup>q</sup> .....	692,100	608,900	603,600	661,000	2,229,000	2,830,000
Steel Ingots <sup>q</sup> .....	1,218,100	1,058,200	1,170,900	938,000	4,011,900	4,192,800

† Three months' average. ‡ 000 omitted. \* Preliminary.

Source of data: \* American Iron and Steel Institute; <sup>b</sup> THE IRON AGE; <sup>c</sup> Bureau of Mines; <sup>d</sup> Lake Superior Iron Ore Association; <sup>e</sup> Bureau of the Census; <sup>f</sup> American Institute of Steel Construction; <sup>g</sup> United States Steel Corp.; <sup>h</sup> Preliminary figures from Ward's Automotive Reports—Final figures from Bureau of the Census, U. S. and Canada; <sup>i</sup> Railway Age; <sup>j</sup> National Machine Tool Builders Association; <sup>k</sup> Foundry Equipment Manufacturers Association; <sup>l</sup> American Bureau of Metal Statistics; <sup>m</sup> American Zinc Institute; <sup>n</sup> New York Commodity Exchange; <sup>o</sup> Copper Institute; <sup>p</sup> Department of Commerce; <sup>q</sup> British Iron and Steel Federation.

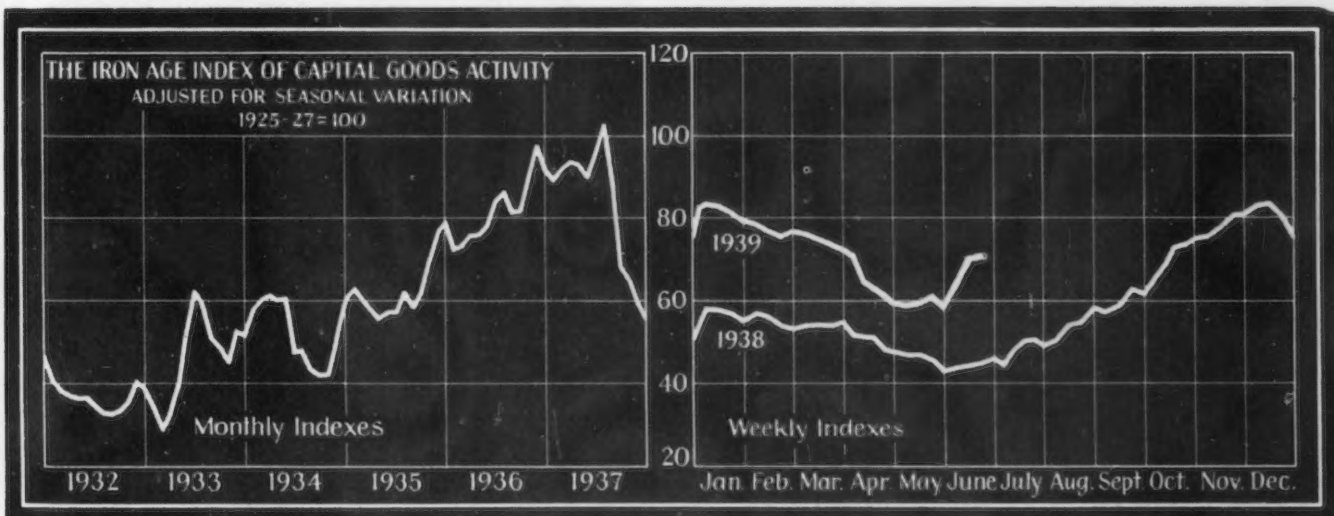


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District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio	Western	St. Louis	East-ern	Aggregate
CURRENT WEEK..	46.0	51.0	52.0	37.0	49.0	34.0	77.0	55.0	70.0	60.5	45.0	44.0	35.0	54.0
PREVIOUS WEEK..	47.0	49.5	55.0	37.0	53.0	44.5	77.0	55.0	70.0	60.5	54.0	44.0	50.0	55.0

## Capital Goods Index Advances for Third Consecutive Week



**B**OLSTERED by contraseasonal gains in steel output, automobile assemblies and lumber carloadings, THE IRON AGE index of capital goods activity advanced 1.6 points to 69.9 in the week ended June 24, the third consecutive weekly improvement this month and the highest level reached by the index since the week of April 8. Heavy engineering construction awards for the week, while slightly below the preceding period, were encouraging in that they reflected a 10 per cent gain in the volume of private work placed. The loss in the Pittsburgh component was due primarily to the slackening of coal production and greater-than-seasonal reductions in rail shipments. At present all

the components of the index are above their respective positions at this time a year ago.

	Week Ended June 24	Week Ended June 17	Comparable Week	
			1938	1929
Steel ingot production <sup>1</sup> .....	80.7	75.8	38.3	137.0
Automobile production <sup>2</sup> .....	73.9	70.0	38.0	135.2
Construction contracts <sup>3</sup> .....	73.8	75.4	53.9	122.2
Forest products carloadings <sup>4</sup> .....	54.6	53.3	48.3	122.2
Production and shipments, Pittsburgh District <sup>5</sup> .....	66.7	67.1	45.5	128.4
Combined index .....	69.9	68.3	44.8	129.0

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.

# SUMMARY OF THE WEEK

... *Some steel companies making effort to stiffen prices.*

o o o

... *Granite City Steel reduces wages except on common labor.*

o o o

... *Steel operations at 54 per cent; steady rate expected after holiday.*

ALTHOUGH price concessions on steel products have not disappeared, there is further evidence this week of a determination on the part of a number of companies to adhere to published quotations. Some companies have given customers until June 30 to accept outstanding quotations at lower than the prices announced as effective for the third quarter.

A plate manufacturer has notified its customers of a plan of quoting prices on projects in which fabrication-in-transit freight rates are involved. Hereafter all such prices will be quoted on a delivered basis at the fabricator's shop, with the allowance for fabrication stop-over billed as a separate item. A similar plan has been in effect for some months on shapes. Abuse of the fabrication-in-transit privilege, which is a device of the railroads and not of the steel companies, has created considerable price confusion, particularly in plates and structural shapes, the products most commonly shipped on this basis.

FOR the first time since the present wage level of the steel industry became effective in March, 1937, a steel company has reduced wages by means of a formal agreement with the CIO. One or two other wage reductions that were made by small companies were not arrived at by formal contracts. The Granite City Steel Co., Granite City, Ill., has reached an agreement with the Amalgamated Association of Iron, Steel and Tin Workers whereby cuts of 2 to 5 per cent will apply to all workers above the common labor rate of 62½c. per hr., which remains unchanged. Employees getting more than the minimum up to 79c. will be cut 2 per cent; those from 80c. to 90c., 3 per cent, and from 91c. up, 5 per cent. There is no indication as yet that such decreases may extend to other companies.

Steel making at the end of the first half of the year is at 54 per cent of the industry's capacity, down only one point from last week. It is estimated that last half production will average about 55 per cent against about 53 per cent for the first half.

Next week's production, influenced by holiday shutdowns, probably will be substantially below this week's, but an immediate pickup to around the present level is expected, followed by a slight bulge during the period when the automobile in-

dustry is taking heavier shipments for production of 1940 models. Some of the motor car companies will start on new models about July 15, with acceleration of schedules in August and September.

Steel ingot production now is closely aligned with finished steel shipments, most companies having completed the process of building up normal stocks of raw steel, which were depleted during the coal strike.

The fact that operations are remaining well above 50 per cent without benefit of important takings by the automobile industry, the railroads and the farm machinery manufacturers is regarded as an augury of fairly well maintained output when these consumers return to the market.

The outlook for railroad buying is the most dubious, but it is possible that some roads which are in need of new equipment may take advantage of the new loan plan proposed by the Administration if the bill passes Congress. One road, which contemplates the purchase of about 5000 cars, may adopt Government financing rather than private. The Western Maryland Railway has ordered 1110 freight cars, divided among three builders.

Main support of current steel operations is the requirements for construction work, can manufacture and miscellaneous manufacturing, in which household equipment stands out as one of the important items. Structural steel specifications at Pittsburgh are running 20 to 25 per cent above those of May, and it is indicated that the present volume will continue for some months. The PWA estimates that the peak of steel requirements for its program will come about the end of July. Orders for fabricated structural steel in May, at 156,207 tons, were the largest recorded this year by the American Institute of Steel Construction and well above those of any month last year excepting December.

This week's structural lettings were small at less than 13,000 tons, but new projects come to nearly 18,000 tons. Reinforcing bar awards, at more than 17,000 tons, were well above the average, while additional jobs totaling nearly 11,000 tons came into the market for bids. Projects requiring plates total about 13,000 tons, of which 9000 tons is for a water supply system at Harrisburg, Pa.

Shipbuilding, both naval and commercial, calls for additional steel tonnages. The Navy Department will take bids July 6 on 21,300 tons of plates, sheets and strip for two 45,000-ton battleships, and the Maritime Commission will take bids Aug. 1 on 11,700 tons of steel for three cargo boats for the Seas Shipping Co., Inc.

SCRAP markets are strong, though a slight readjustment of price at Chicago has resulted in a decline of 4c. in THE IRON AGE scrap composite figure to \$14.71. Purchases recently made by the International Scrap Convention of Europe were above 500,000 tons, which brings total purchases so far this year to about 1,000,000 tons, most of which will be used by Great Britain.



# A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous  
Advances Over Past Week in Heavy Type, Declines in Italics

## Rails and Semi-finished Steel

Per Gross Ton:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
Rails, heavy, at mill .....	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham .....	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point ..	34.00	34.00	34.00	34.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point .....	34.00	34.00	34.00	34.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point .....	34.00	34.00	34.00	34.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham .....	40.00	40.00	40.00	40.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland .....	43.00	43.00	43.00	43.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb. ....	1.90	1.90	1.90	1.90

## Finished Steel

Cents Per Lb.:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham .....	2.15	2.15	2.15	2.25
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont .....	*2.10	2.10	2.10	2.10
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham ..	*2.10	2.10	2.10	2.10
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary .....	2.65	2.65	2.65	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton .....	2.70	2.70	2.70	2.80
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham .....	2.00	2.00	2.00	2.15
Cold rolled strip: Pittsburgh, Cleveland, Youngstown ..	2.80	2.80	2.80	2.95
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham ..	3.50	3.50	3.50	3.50
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown ..	2.00	2.00	2.00	2.15
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown .....	3.05	3.05	3.05	3.20

\*Subject to concessions in some districts.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham .....	2.45	2.45	2.45	2.45
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham .....	2.60	2.60	2.60	2.60
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham .....	†3.30	3.30	3.30	3.20
Tin plate, 100 lb. base box: Pittsburgh and Gary .....	\$5.00	\$5.00	\$5.00	†\$5.35

\*Pittsburgh prices only.

†Applies to 80-rod spools only.

‡Subject to post-season adjustment.

## Pig Iron

Per Gross Ton:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
No. 2 fdy., Philadelphia .....	\$22.84	\$22.84	\$22.84	\$25.84
No. 2, Valley furnace .....	21.00	21.00	21.00	20.00
No. 2, Southern Cin'ti. ....	21.06	21.06	21.06	20.06
No. 2, Birmingham .....	17.38	17.38	17.38	16.38
No. 2, foundry, Chicago .....	21.00	21.00	21.00	20.00
Basic, del'd eastern Pa. ....	22.34	22.34	22.34	25.34
Basic, Valley furnace .....	20.50	20.50	20.50	19.50
Malleable, Chicago .....	21.00	21.00	21.00	20.00
Malleable, Valley .....	21.00	21.00	21.00	20.00
L. S. charcoal, Chicago .....	28.34	28.34	28.34	30.34
Ferromanganese, seab'd carlots .....	80.00	80.00	80.00	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

## Scrap

Per Gross Ton:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
Heavy melting steel, P'gh. ....	\$15.25	\$15.25	\$14.375	\$12.75
Heavy melting steel, Phila. ....	15.50	15.50	15.25	12.75
Heavy melting steel, Ch'go. ....	13.375	13.50	13.00	10.75
Carwheels, Chicago .....	12.75	12.75	12.75	12.50
Carwheels, Philadelphia .....	16.00	16.00	16.00	14.75
No. 1 cast, Pittsburgh .....	15.25	15.25	15.25	14.25
No. 1 cast, Philadelphia .....	16.25	16.25	16.25	15.25
No. 1 cast, Ch'go (net ton) ..	12.25	12.25	11.75	10.75

## Coke, Connellsville

Per Net Ton at Oven:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
Furnace coke, prompt .....	\$3.75	\$3.75	\$3.75	\$3.75
Foundry coke, prompt .....	4.75	4.75	4.75	4.75

## Non-Ferrous Metals

Cents per Lb. to Large Buyers:	June 27, 1939	June 20, 1939	May 29, 1939	June 28, *1938
Copper, electrolytic, Conn. ....	10.00	10.00	10.00	9.00
Copper, lake, New York. ....	10.00	10.00	10.00	9.125
Tin (Straits), New York. ....	49.00	49.125	49.00	42.25
Zinc, East St. Louis .....	4.50	4.50	4.50	4.50
Zinc, New York .....	4.89	4.89	4.89	4.89
Lead, St. Louis .....	4.70	4.70	4.60	4.35
Lead, New York .....	4.85	4.85	4.75	4.50
Antimony (Asiatic), N. Y. ....	14.00	14.00	14.00	14.00

# The Iron Age Composite Prices

## Finished Steel

June 27, 1939	2.236c. a Lb.
One week ago	2.236
One month ago	2.236
One year ago	2.350

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	High	Low
1939 .....	2.286c., Jan. 3	2.236c., May 16
1938 .....	2.512c., May 17	2.211c., Oct. 18
1937 .....	2.512c., Mar. 9	2.249c., Jan. 4
1936 .....	2.249c., Dec. 28	2.016c., Mar. 10
1935 .....	2.062c., Oct. 1	2.056c., Jan. 8
1934 .....	2.118c., Apr. 24	1.945c., Jan. 2
1933 .....	1.953c., Oct. 3	1.792c., May 2
1932 .....	1.915c., Sept. 6	1.870c., Mar. 15
1931 .....	1.981c., Jan. 13	1.883c., Dec. 29
1930 .....	2.192c., Jan. 7	1.962c., Dec. 9
1929 .....	2.223c., Apr. 2	2.192c., Oct. 29
1928 .....	2.192c., Dec. 11	2.142c., July 10

## Pig Iron

\$20.61 a Gross Ton
20.61
20.61
21.91

Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

High	Low
23.25, June 21	19.61, July 6
23.25, Mar. 9	20.25, Feb. 16
19.73, Nov. 24	18.73, Aug. 11
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17
18.59, Nov. 27	17.04, July 24

## Steel Scrap

\$14.71 a Gross Ton
14.75
14.21
12.08

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

High	Low
15.29, Mar. 28	14.08, May 16
15.00, Nov. 22	11.00, June 7
21.92, Mar. 20	12.92, Nov. 10
17.75, Dec. 21	12.67, June 9
13.42, Dec. 10	10.33, Apr. 29
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.08, Dec. 3
16.50, Dec. 31	13.08, July 9

# ... THIS WEEK'S MARKET NEWS ...

## PRICES

*... Firmer tendency noted ...  
Concessions may be withdrawn*

ALTHOUGH price concessions are still quite common on a number of products, particularly plates and shapes, where abuses of the fabrication-in-transit privilege have complicated this situation, there is evidence this week of an effort on the part of some mills to firm up prices. In fact, in some instances buyers have been notified that outstanding prices below published levels will be withdrawn at the end of this month unless taken advantage of meanwhile.

Consumers of products other than sheets and strip have been bringing considerable pressure to bear on the mills, contending that price concessions given to sheet and strip users should be passed on to uses of other products.

One plate manufacturer is attempting to end some of the abuses of the f.i.t. by quoting henceforth on a basis of delivered price fabricator's shop, with an allowance for stop-over as a separately billed item.

## STEEL OPERATIONS

*... Ingot output 54% this week  
... May go much lower in holiday week*

STEEL ingot output this week is estimated at 54 per cent, off one point from last week, but probably will go much lower next week owing to holiday shutdowns. A number of mills will tap out open hearths Saturday night and will not resume melting until midnight Tuesday. Ingot operations in the past two weeks have been closely aligned with actual finished steel shipments. The building up of semi-finished steel inventories a few weeks ago has resulted in normal stocks of raw steel, some of which were reduced during the coal strike.

At PITTSBURGH the rate this week is 46 per cent, one point off from last week. The WHEELING-WEIRTON district is unchanged at 77 per cent. Output has eased a little in the CLEVELAND-LORAIN, YOUNGSTOWN, BUFFALO and WESTERN districts, but is up moderately at CHICAGO.

After the Fourth of July week operations are expected to regain approximately the present position and may go slightly higher in late July or in August, whenever new specifications from the automobile industry appear in substantial volume.

## NEW BUSINESS

*... Aggregate tonnage in June will run ahead of May*

New business at PITTSBURGH during the past week was a shade larger in volume than that of the previous week, due in part to a slightly better flow of sheet and strip releases, emanating from miscellaneous sources. Steel producers look for an exceptionally quiet period next week owing to holiday influences, but a quick pick-up is expected in the following week. On the whole, orders placed during June will run slightly ahead of the May period despite the fact that consumers have not seen fit to send in sheet and strip specifications as quickly as had been anticipated. As a matter of fact, sheet and strip releases against low priced commitments have not been coming in any faster than would have been the case had there been no price concessions last month.

Trends among consuming industries near CLEVELAND and YOUNGSTOWN are assuming a more mixed aspect. Nevertheless, aggregate steel purchases over the past 10 days have proved gratifying and somewhat above expectations. Seasonal influences including vacations and inventory periods have slowed down some industries but others continue active, particularly those sharing Government awards or foreign orders. Steel orders continue to be almost entirely for actual use. Jobbers of bolts and nuts, notified this week of a 10 to 11 per cent advance effective during July, are buying more freely.

The most heartening news in the CHICAGO territory is the report of one office that sales have been fairly constant over the first three weeks in June. This is important because automobile, railroad and farm equipment orders accounted for practically none of this business, the main support be-

ing miscellaneous. Provided this demand is maintained when the automobile production on new models begins late next month, operations should receive a boost upward. One important mill in CHICAGO can see no good business ahead except that expected to originate from DETROIT at the end of July.

The only buying of rails lately was 7700 tons placed by the Burlington, which probably finishes up rail purchases by Western roads until late in the summer. Structural and reinforcing bars are in fairly good demand in the Middle West, but prices on both items are depressing factors.

Construction will start Aug. 1 at Pana, Ill., on the first refinery to result from the oil exploration campaign in the central Illinois oil fields. About \$250,000 will be spent on plant and equipment and an additional \$100,000 for a 25-mile, 6-in. pipe line.

New business in PHILADELPHIA this month has exceeded the May volume, even when excluding sheets and strip from consideration. Heavy steel and tin plate account for the bulk of the activity, but merchant bar, plate and pig iron sales also show some improvement. The sources of this business has been very well diversified.

## PIG IRON

*... Shipments steady, but sales continue light on hand-to-mouth basis*

SHIPMENTS against old contracts continue at the level established in May in most districts. New business remains spotty, with all consumers practically on a hand-to-mouth basis. At PHILADELPHIA the volume of this type of business in June has generally been in excess of the May volume, largely due to seasonal increases in foundry operations on the part of pressure pipe makers, heating equipment manufacturers and hardware foundries. NEW ENGLAND furnaces obtained a few carlot orders the early part of last week, but as the days passed business grew progressively duller. The average foundry there is operating at a greatly reduced schedule. At PITTSBURGH spotty purchases



are the result of many companies drawing in previous to inventory and financial reports covering second quarter and half year findings. Fourth of July holiday shutdowns and mass vacations are other influences reported.

Contracting for third quarter delivery continues light, few foundries indicating a willingness to make extended commitments even though present selling practices would protect them in the event of a subsequent price decline.

Foundry operations in the CINCINNATI area are still fluctuating around 50 per cent, with machine tool and stove interests most active. Heater equipment makers are also busy in northern New Jersey, but the melt is not up to earlier expectations. Jobbing foundries are dull there, but an increase in activity among BROOKLYN jobbers is reported.

The BIRMINGHAM market is not very active. Fourteen furnaces continue in operation, the same as last week.

## BOLTS, NUTS, RIVETS

*... Advance of 10 to 11% to jobbers for July announced*

SOME of the larger bolt and nut companies are reaffirming their present consumer prices for third quarter. At the same time, jobbers are being notified of a 10 to 11 per cent advance effective during July. This action in the jobber market follows concessions inaugurated at the close of May for June orders. Early this week there were indications that jobbers would protect themselves against the scheduled advance by getting their requirements on producers' books before July 1.

## SEMI-FINISHED STEEL

*... Spurt in sales at Pittsburgh in past week*

SEMI-FINISHED steel business in the past week was substantially ahead of that done in the previous week. The improvement, however, is similar to previous periods of peaks and valleys in aggregate business. Orders so far this month are substantially equivalent to bookings placed during the same number of days last month. Support from forge shops is expected as soon as automotive

companies complete definite arrangements for 1940 model production.

Sales of sheet bars, rerolling and forging billets at CLEVELAND and YOUNGSTOWN continue moderately active but lacking any sharp upturn over other recent weeks.

## REINFORCING BARS

*... 9000 tons awarded to Sweet's Steel Co. for Federal job*

REINFORCING bars are quite active in both awards and inquiries. Steel producers are optimistic regarding the outlook in this particular field.

Outstanding in this week's awards is 9000 tons for a Federal office building in Washington, awarded to Sweet's Steel Co. The largest private project was 1300 tons for a building for the Washburn-Crosby division of General Mills, Inc., at Buffalo, taking 1300 tons, which the Bethlehem Steel Co. will furnish.

Awards on the Pacific Coast during the week totaled 3000 tons, the largest of which was 970 tons for the Central Valley, Cal., project awarded to Columbia Steel Co.

Among public undertakings, housing projects are prominent in tonnage. One at Memphis, Tenn., calls for 1955 tons and one at Charlestown, Mass., for 1500 tons.

## STRUCTURAL STEEL

*... Specifications against contracts running well ahead of May*

THE extent to which building construction activities are aiding steel mills is indicated by the fact that specifications for shapes against outstanding contracts are running 20 to 25 per cent ahead of May at PITTSBURGH, also by the fact that May fabricated steel contracts reported by the American Institute of Steel Construction, at 156,207 tons, were the largest for any month of this year and were better than in any month last year excepting December. Sheet piling business is also in good volume.

Prices on plain material have been subject to concessions. Although this situation is not new, it has been aggravated by increasing competition in this field.

The largest award reported is 3300 tons for the William Howard Taft High School in NEW YORK, taken by Bethlehem Fabricators, Inc. The

Blaw-Knox Co. will fabricate 1600 tons of transmission towers for erection by the TVA near Lawrenceburg, Tenn. For work on the Circumferential Highway, BROOKLYN, 900 tons was awarded to the Taylor-Fichter Co. A public school in NEW YORK, requiring 850 tons, was awarded to the Lehigh Structural Steel Co.

Highway work accounted for the largest new pending projects—2600 tons for the Short Parkway in BROOKLYN and 1300 tons for a viaduct in CINCINNATI.

## TUBULAR GOODS

*... Oil country specifications gain slightly ... Merchant demand fair*

OIL-COUNTRY goods specifications at PITTSBURGH so far this month are slightly in excess of the volume placed during the same number of days in May. Total pipe sales in the past week were changed but little from the previous week although activity in merchant pipe is still expanding. Although no new line pipe business is out at present, at least two lines involving substantial tonnages are in the offing. The sale of oil-country tubular goods from distributors' stocks, effective June 21, was based on an advance of 10.6 per cent over the carload direct shipment price, instead of 5 per cent as heretofore. No change in the direct shipment carload price from mills, Houston, or Memphis depots has been made. Some pipe makers have established mill depots at Wilmington, Cal.

Orders improved numerically at CLEVELAND last week, but the aggregate tonnage was approximately the same as in other recent periods. Standard pipe for the construction industry remains in good demand.

## SHEETS AND STRIP

*... Specifications are moderately better other than from automotive companies*

SHEET and strip specifications at PITTSBURGH in the past week were moderately ahead of the previous period and bookings so far this month on the average are substantially ahead of the same period a month ago. Producers have encountered a little more success within the past few days in having consumers send in specifications.

Demand, of course, is mostly from sources other than automotive. Refrigerator makers, washing machine manufacturers and other home appliance interests are specifying a little more freely and it is expected that this trend from these sources will continue. Such support will tend to offset to some extent the dull period in automotive demand until 1940 models are into regular production.

Hot and cold rolled sheets continue to be in active demand in SOUTHERN OHIO, while an improved demand for stainless and galvanized material has helped push the market to about a 60 per cent order level during the past week.

For some sheet sellers in the NEW YORK area specifications on the low-priced tonnages are being received in satisfactory volume, one seller reporting a release of over 500 tons. Other sellers report June specifications running below those of May. There was another flurry of price cutting in galvanized sheets last week, prices going down to 3.10c. per lb., but the base of 3.50c. was reestablished on Wednesday, June 21. No new business has been booked since then and the market is untested.

## PLATES

*... Manufacturer changes method of quoting on f. i. t. sales*

**F**ABRICATION - IN - TRANSIT rates, which have been the root of considerable price irregularity in plates as well as in structural shapes, are to be handled in a different manner henceforth by one plate manufacturer which has sent the following notice to its customers:

Fabricated-in-transit or f. i. t. sales will be handled in the following manner. (Note that this is a revision as compared to our past practice.) All prices to fabricators will be quoted f.o.b. their shop regardless of the ultimate destination; however, consideration will be given to the allowance brought about by fabricated-in-transit freight rates available on plate projects fabricated at some customer's shop for reshipment to another destination for erection at that point. You will realize that this fabricated-in-transit privilege is only available on fabricated commodities which may be reshipped at the same freight rate as the steel required for this work.

The f. i. t. price modification will be detailed as a separate item in all quotations and naturally reflected in a similar manner on all invoices. This method will result in the buyer realizing that the lower net price is brought about by the reflected adjustment for transit privileges.

It is customary to include for such fabricated-in-transit privileges a stop-over charge of 3½ c. per cwt. This means that we will quote on all fabricated-in-transit projects as follows:

"We quote you (base price plus freight to fabricator's shop) \$.... per cwt. base f.o.b. .... (fabricator's shop)."

"This price is subject to a deduction of \$.... per cwt. on account of freight disadvantages on shipments from our mill through your shop to .... (location of structure at ultimate destination)."

All freight rates involved will be based on published freight tariffs only and fabricated-in-transit privileges extended only as authorized by freight tariffs.

If other companies should adopt this plan, some of the price confusion in the plate trade might disappear. The abuses of the f. i. t. privilege have created one of the industry's most serious problems. Meanwhile some mills are giving a grace period only until June 30 for the acceptance of outstanding quotations below the level that was announced as effective for the third quarter, namely 2.10c. a lb. at basing points. Concessions of \$2 a ton on plates are quite common, while in occasional instances more than this amount has been granted.

Plate business at PITTSBURGH compares favorably with total bookings placed last month.

New business at CLEVELAND is running slightly ahead of the May volume. One of the largest projects outstanding in OHIO is section I of the Toledo municipal intake line which will require 2800 tons of 72-in. pressure pipe, with bids due July 19.

Bookings in EASTERN PENNSYLVANIA in June have been above the May level, due largely to better activity on the part of fabricating shops. Outside of 500 tons for the Reading, support from the railroads and the shipyards has been negligible all month.

A water supply system at Harrisburg, Pa., calls for 9000 tons of plates for section No. 4. Bids are due July 11.

Bids will be taken July 14 for another section of the Southern Pacific's relocation around Shasta Dam, Central Valley Project, Cal., involving 300 tons or more of tunnel supports. Hardie-Tynes Mfg. Co., Birmingham, is apparent low bidder on slide gates for Hansen Dam near Los Angeles, involving 372 tons.

## WIRE PRODUCTS

*... Increased buying awaits automobile industry's activity on new models*

**A**LTHOUGH merchant wire bookings at PITTSBURGH are still running about 30 per cent behind the

volume placed during the same number of days last month, orders in the past week were moderately heavier, owing to small coverages previous to the withdrawal of all concessions early last week. As has been the practice for several months, orders taken last week on merchant wire products were on the basis of shipment within 60 days after date of order. With substantial support from the automotive interests lacking, manufacturers' wire demand last week receded further.

Incoming orders at CLEVELAND during June consisted principally of merchant product requirements. Increased buying of manufacturers' wire awaits higher activity on the part of the automobile industry.

Merchant wire products continue to lead sales in CHICAGO. No great increase in manufacturers' wire is expected there until production gets underway on next year's motor cars.

## MERCHANT BARS

*... Sales at Pittsburgh 30% over May ... Up slightly elsewhere*

**W**ITH orders emanating from widely diversified sources, bar bookings at PITTSBURGH are approximately 30 per cent ahead of the same period a month ago. Orders in the past week, however, were not up to the volume of the previous week but a fair amount of business is expected previous to July 1, when large buyers are to pay \$1 a ton higher than heretofore. Coverage so far under the old setup in prices has been moderate and producers look for no heavy rush of buying in view of the small savings.

Incoming business at CLEVELAND and YOUNGSTOWN during June will exceed May volume, but in general forward buying has been light. Pressure has increased upon sellers to accept long term deliveries, but producers are hesitant to accede. Special sections are in better demand than plain bars.

Little interest in bars is being shown in the CHICAGO district. Several implement plants are shut down for vacations and inventory, and the buying that precedes the new automobile models does not seem to have begun in earnest. Jobbers are busy, however, and their orders indicate a continuation of the old policy of purchasing for immediate requirements.

Merchant bar demand has shown a



small improvement at PHILADELPHIA recently, but as yet there has been no evidence of large scale stocking on the part of large users to avoid the \$1 increase for them which will go into effect on July 1.

### COLD FINISHED BARS

... Sales continue to show a moderate gain

COLD finished bar sales recently have continued the moderate gain exhibited several weeks ago, with the honors fairly well divided between automotive and miscellaneous demand. Specifications from automobile makers have increased in the past week and a further gain is anticipated.

### RAILROAD BUYING

... Western Maryland orders 1110 freight cars

WESTERN MARYLAND RAILWAY has placed orders for 1110 freight cars as follows: 500 box cars to Pressed Steel Car Co., Pittsburgh; 500 hopper cars to Bethlehem Steel Co.; and 100 gondolas and 10 flat cars to Greenville Steel Car Co., Greenville, Pa. Approximately 13,000 tons of material, including wheels, will be utilized.

The Florida East Coast Railway has purchased two seven-car streamlined stainless steel trains from the Edward G. Budd Mfg. Co.

Chicago, Rock Island & Pacific has ordered one streamlined diesel-electric locomotive from American Locomotive Co. Green Bay & Western has purchased three 2-8-2 type locomotives, also from American Locomotive Co., and the directors of Kansas

City Southern have authorized the purchase of one diesel-electric switching locomotive. Chicago, Rock Island & Pacific has undertaken an improvement program, involving an expenditure of \$442,000, which includes the purchase of 21 locomotive tenders, the enlargement of 12 tender tanks and the application of roller bearings and new trucks to 30 locomotives. The Wabash has been authorized by U. S. District Judge Davis at St. Louis to purchase a 300-hp. diesel switching locomotive from General Electric Co.

Dow Chemical Co. is considering the purchase of 10 tank cars of 8000-gal. capacity.

The Burlington road has purchased 7700 tons of rails. In addition to the 4000 tons bought from Carnegie-Illinois Steel Corp., the award of which was reported last week in THE IRON AGE, Colorado Fuel & Iron Corp. was given 2700 tons; and Inland Steel Co., 1000 tons.

Movement of wheat in the Southwest is threatening a car shortage. Several roads in that territory are hard pressed for cars and indicate clearly the position most railroads would be in if good business all along the line should develop.

### TIN PLATE

... Operations at 68%, off two points ... Outlook still good

TIN plate operations for the industry this week are estimated at 68 per cent, off two points from a week ago. The decline is not significant, however, and undoubtedly represents balancing of operations against incoming specifications. Peak production, some quarters believe, has not yet been reached and further substantial releases from sanitary can makers

are expected in the near future. The volume of general line can business was changed but little in the past week.

CHICAGO district tin mills are operating at about 60 per cent of capacity. Not a great deal of new business is coming in at present, but tonnage on the books probably will support the mills through July. New orders may be seen in August for the fall packing season.

### SHIPBUILDING

... Battleships call for 21,300 tons plates, sheets and strip

THE Bureau of Supplies and Accounts, Navy Department, will open bids on July 6 for 21,300 tons of plates, sheets and strip for the two 45,000-ton battleships, one building at the New York and the other at the Philadelphia navy yard. Broken down, the requirements in tons are: Black plates, 17,200; galvanized plates, 3400; black sheets, 300; galvanized sheets, 125; black strips, 200 and galvanized strips, 75.

The Maritime Commission has invited bids to be opened Aug. 1 for the construction of three cargo vessels for the Seas Shipping Co., Inc., of New York. To be built under the commission's differential subsidy plan, the ships will be turbine propelled, approximately 485 ft. overall length and will require a total of 11,700 tons of steel.

American Engineering Co., Philadelphia, manufacturer of Lo-Hed monorail electric hoists, has appointed A. C. Cooper Sales Co., 220 East 42nd Street, New York, as sales representative for metropolitan New York, Long Island, and northern New Jersey.

## Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	June 27, 1939	June 20, 1939	May 29, 1938	June 28, 1938	1939	1938
Fabricated structural steel awards ....	12,850	23,300	35,225	11,625	513,225	340,375
Fabricated plate awards .....	125	1,275	1,610	495	90,975	69,495
Steel sheet piling awards .....	2,200	4,050	1,400	170	33,155	14,320
Reinforcing bar awards .....	17,125	8,000	7,400	11,000	247,120	121,270
Total Letting of Construction Steel..	32,300	36,625	45,635	23,290	884,475	545,460

# IRON AND STEEL SCRAP

*... Most markets marking time until after the holiday ...  
Composite declines 4c. to \$14.71.*

**J**UNE 27—Extreme dullness prevails in most district markets, but little weakness can be discerned. Restriction of shipments continues at some points, particularly Buffalo, and no substantial mill buying in any district is expected until after the holiday. Broker coverages at Pittsburgh indicate strength in that market for No. 1 steel and blast furnace grades were much stronger as a result of a 3000-ton sale to a mill. Export buying continues to support the price of Nos. 1 and 2 steel at Philadelphia, where domestic buying is absent. At Chicago, there has been a decline of 12½c. in the average for No. 1 steel, following a recent mill sale, but this sign of weakness is partly offset by the fact that brokers are having difficulty in covering this order at a profit. Except for No. 1 steel and shoveling steel, prices are unchanged at Chicago, as they are in most other districts. THE IRON AGE composite price has declined 4c. for the second consecutive week, bringing the average price for No. 1 to \$14.71, still well above the low of \$14.08 recorded on May 16 and 23. A year ago the average was \$12.08.

Revised estimates on the European orders placed in June put the figure at around 500,000 tons, making total European cartel orders this year to date about 1,000,000 tons.

## **Pittsburgh**

A lull in activity has crept into the market which will undoubtedly continue until after the holidays next week. Basic conditions, however, continue strong, with brokers still paying from \$14.75 to \$15.25 on No. 1 heavy melting in covering recent business. Some consumers have been offered tonnages of No. 1 heavy melting at \$15 while other consuming points in the district are still paying around \$15.50. A small amount of old business has been released recently by one mill. In addition to the holiday influence, the pending railroad list closings have tended to reduce activity. Mixed borings and turnings and cast iron borings were much stronger in the past week owing to a sale involving 3000 tons to a mill at \$9 a ton. Smaller lots of these two items have been purchased at less than this figure but an appraisal of the conditions surrounding the market for these two products warrants a spread of \$1 a ton this week.

## **Chicago**

A small tonnage of heavy melting steel has been sold to the leading customer for \$13.50, down 25c. from his own last purchase a week ago. Though the price of steel is quoted this week at \$13.25 to \$13.50, it is done so more for the record

than because the market is actually weaker. Since it is impossible for brokers to buy for less than \$13.25, and with \$13.50 having to be paid for lots of 400 and 500 tons, this market cannot really be regarded as weak. The Rock Island received over \$14 a gross ton delivered in Chicago for No. 1 steel last week.

## **Philadelphia**

There were no new purchases of steel-making grades in the past week, but current quotations on these items remain unchanged due to the continued strong export demand. Several mills in this district have been slowing down delivery schedules in anticipation of an extended Fourth of July shutdown, but resumption of shipments at a normal pace is anticipated immediately after the holiday. Export buying is still absorbing most of the material entering this market and present indications are that June shipments from Port Richmond will set a new record. Budd will close on 1200 tons of bundles on June 30, the smallest monthly lot offered in some time. The last lot totaled 2800 tons.

## **Cleveland**

Dealer buying, vessel and rail shipments to mills, and prices remain about the same as last week here. All persons interested in the market are inclined to hold back until after the Fourth of July before making any new commitments. Prime heavy grades are none too plentiful.

## **Youngstown**

Despite a drop in steel production here from the high mark last week, very little change either way in prices is expected until after the month of July gets under way. Upon several days recently shipments have been regulated closer at Warren.

## **Buffalo**

Suspension and restriction of shipments continue at two of the principal mills in the district. The market remains dull and no new business has been noted. Prices are unchanged. Sentiment is fairly good but dealers do not anticipate any real activity until after the Fourth.

## **St. Louis**

The scrap iron market is steady, with prices unchanged except for miscellaneous standard section rails, which are 50c. a ton lower to meet the offer of a local consumer. There is some short interest by dealers, with very little scrap coming in. Several district consumers have temporarily suspended receipt of scrap against contracts because of inventory. Railroad lists: Chicago, Milwaukee, St. Paul & Pacific, 125 carloads; Illinois Central, 4900 tons, and Wabash, 1200 tons. Standard Oil of Indiana offers 200 tons of borings.

## **Cincinnati**

There is relatively no movement in the district old materials market, although

prices seem to hold at present levels. Reported weaknesses in other areas have not affected the local market and in fact, dealers report that any attempt to cut current bids on available material causes sources to dry up. New business during the past week was largely in the cast grades for foundry use, mills still appearing to be definitely reluctant toward new commitments. Shipments on old contracts, however, continue to be good and trading in steel scrap was largely for application upon these old commitments.

## **Detroit**

A marked shift in sentiment has occurred in recent weeks among Detroit scrap dealers and brokers and the mixed feelings of a week ago have given way to a decided tinge of pessimism based on the condition of local and outside markets. The closing of numerous automotive lists during the current week for the first month of the third quarter will see something of a test in prices undoubtedly. However, it was difficult early in the week to determine what the results might be because the very low tonnages offered on lists were expected to have an effect of unknown proportions. The small tonnages might have the effect of sustaining or even bolstering prices despite the general sentiment.

## **New York**

Revised estimates put the total of mid-June orders from the International Scrap Convention at about 500,000 tons, following the placement of about 300,000 tons in early May. Together with April business, the 1939 orders are close to a million tons. Over half the recent tonnages will go to Great Britain, and as far as this country is concerned, no further buying is expected by brokers until late fall for 1940 delivery. In 1938, approximately 1,500,000 tons of scrap was shipped to Europe.

## **Boston**

Prices for domestic and export materials are unchanged, but not as firm as heretofore, presumably because of foreign political developments. Loadings for export continue active, but for Pennsylvania are virtually at a standstill. Some large New England foundries, however, have shown a rather lively interest in machinery and textile cast. One Massachusetts textile machinery maker has accumulated an unusually large tonnage of such material, paying around \$12.50 a ton, delivered. Buyers of New Haven rails are now actively moving them from railroad property. Some of the rails are going into yard stocks, some are being exported to England, and small tonnages sold as relays at prices ranging from \$18.50 to \$21 a ton on cars.

## **Toronto**

Canadian iron and steel scrap markets failed to register improvement during the week, while prices as a whole remained unchanged. Local dealers are beginning to feel the effect of recent price reductions in a falling off in scrap offerings by small dealers and collectors. Contracts continue for short terms and fairly large shipments of heavy melting steel are being made against contract to the Hamilton mills. Foundry interests are taking cast scrap and there is a fairly active market for the No. 2 grade. There is no demand for stove plate.



# Iron and Steel Scrap Prices

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel	\$15.00 to \$15.50
Railroad hvy. mtng.	16.00 to 16.50
No. 2 hvy. mtng. steel	13.75 to 14.25
Scrap rails	16.00 to 16.50
Rails 3 ft. and under	17.50 to 18.00
Comp. sheet steel	15.00 to 15.50
Hand bundled sheets	14.00 to 14.50
Hvy. steel axle turn	13.50 to 14.00
Machine shop turn	9.00 to 9.50
Short shov. turn	10.50 to 11.00
Mixed bor. & turn	8.00 to 9.00
Cast iron borings	8.00 to 9.00
Cast iron carwheels	14.50 to 15.00
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	15.00 to 15.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
Low phos. billet crops	18.50 to 19.00
Low phos. punchings	17.50 to 18.00
Low phos. plate	16.00 to 17.00

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel	\$15.50
No. 2 hvy. mtng. steel	13.50
Hydraulic bund., new	\$14.50 to 15.00
Hydraulic bund., old	11.50 to 12.00
Steel rails for rolling	17.00 to 17.50
Cast iron carwheels	16.00
Hvy. breakable cast	14.50 to 15.00
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.50 to 16.00
Machine shop turn	8.50
No. 1 blast furnace	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings	10.00 to 10.50
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	12.00 to 12.50
Cast boring (chem.)	9.50 to 10.00

## CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mtng. steel	\$13.25 to \$13.50
Auto. hvy. mtng. steel alloy free	11.75 to 12.25
No. 2 auto steel	10.25 to 10.75
Shoveling steel	13.25 to 13.50
Factory bundles	12.25 to 12.75
Dealers' bundles	11.25 to 11.75
Drop forge flashings	9.25 to 9.75
No. 1 busheling	11.75 to 12.25
No. 2 busheling, old	5.25 to 5.75
Rolled carwheels	14.50 to 15.00
Railroad tires, cut	15.00 to 15.50
Railroad leaf springs	14.50 to 15.00
Steel coup. & knuckles	14.25 to 14.75
Axle turnings	12.50 to 13.00
Coil springs	16.50 to 17.00
Axle turn. (elec.)	13.50 to 14.00
Low phos. punchings	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	6.50 to 7.00
Short shov. turn	6.50 to 7.00
Machine shop turn	6.50 to 7.00
Rerolling rails	18.00 to 18.50
Steel rails under 3 ft.	16.00 to 16.50
Steel rails under 2 ft.	16.50 to 17.00
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.50 to 13.00
Railroad malleable	15.00 to 15.50
Agric. malleable	12.00 to 12.50

Per Net Ton

Iron car axles	\$18.00 to \$13.50
Steel car axles	17.50 to 18.00
Locomotive tires	13.00 to 13.50
Pipes and flues	8.50 to 9.00
No. 1 machinery cast	12.00 to 12.50
Clean auto. cast	12.50 to 13.00
No. 1 railroad cast	11.00 to 11.50
No. 1 agric. cast	10.00 to 10.50
Stove plate	7.75 to 8.25
Grate bars	7.75 to 8.25
Brake shoes	9.50 to 10.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel	\$15.00 to \$15.50
No. 2 hvy. mtng. steel	14.00 to 14.50
Low phos. plate	16.25 to 16.75
No. 1 busheling	14.25 to 14.75
Hydraulic bundles	14.50 to 15.00
Machine shop turn	9.00 to 9.50

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel	\$14.00 to \$14.50
No. 2 hvy. mtng. steel	13.00 to 13.50
Comp. sheet steel	13.50 to 14.00
Light bund. stampings	9.75 to 10.25
Drop forge flashings	11.50 to 12.00
Machine shop turn	7.50 to 8.00
Short shov. turn	8.00 to 8.50
No. 1 busheling	13.00 to 13.50
Steel axle turnings	10.50 to 11.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	8.00 to 8.50
Mixed bor. & turn	8.00 to 8.50
No. 2 busheling	8.25 to 8.75
No. 1 cupola cast	15.50 to 16.00
Railroad grate bars	11.00 to 11.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.75 to 18.25
Rails for rolling	17.50 to 18.00
Railroad malleable	15.00 to 15.50
Cast iron carwheels	13.50 to 14.00

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel	\$13.00 to \$13.50
Railroad hvy. mtng.	13.50 to 14.00
No. 2 hvy. mtng. steel	11.00 to 11.50
Scrap rails	13.50 to 14.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraul. bundles	10.00 to 10.50
Drop forge flashings	11.00 to 11.50
No. 1 busheling	11.00 to 11.50
Machine shop turn	6.00 to 6.50
Knuckles & couplers	15.00 to 15.50
Coil & leaf springs	15.00 to 15.50
Rolled steel wheels	15.00 to 15.50
Shov. turnings	7.00 to 7.50
Mixed bor. & turn	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 1 machinery cast	15.00 to 16.00
No. 1 cupola cast	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels	13.50 to 14.00
Railroad malleable	15.00 to 15.50

## ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	\$11.75 to \$12.25
No. 1 hvy. melting	11.50 to 12.00
No. 2 hvy. melting	10.50 to 11.00
No. 1 locomotive tires	12.25 to 12.75
Misc. stand. sec. rails	12.50 to 13.00
Railroad springs	14.00 to 14.50
Bundled sheets	7.00 to 7.50
No. 1 busheling	7.50 to 8.00
Cast bor. & turn	2.50 to 3.00
Machine shop turn	4.50 to 5.00
Heavy turnings	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Steel car axles	17.00 to 17.50
No. 1 RR. wrought	9.75 to 10.25
No. 2 RR. wrought	11.50 to 12.00
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels	14.00 to 14.50
No. 1 machinery cast	14.50 to 15.00
Railroad malleable	12.00 to 12.50
No. 1 railroad cast	12.00 to 12.50
Stove plate	7.50 to 8.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

## CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mtng. steel	\$11.00 to \$11.50
No. 2 hvy. mtng. steel	8.75 to 9.25
Scrap rails for mtng.	14.50 to 15.00
Loose sheet clippings	6.50 to 7.00
Hydru. b'ndled sheets	10.50 to 11.00
Cast iron borings	3.25 to 3.75
Machine shop turn	4.50 to 5.00
No. 1 busheling	7.25 to 7.75
No. 2 busheling	2.25 to 2.75
Rails for rolling	16.50 to 17.00
No. 1 locomotive tires	13.25 to 13.75
Short rails	17.25 to 17.75
Cast iron carwheels	12.50 to 13.00
No. 1 machinery cast	12.00 to 12.50
No. 1 railroad cast	12.00 to 12.50
Burnt cast	6.25 to 6.75
Stove plate	6.25 to 6.75
Agricul. malleable	10.75 to 11.25
Railroad malleable	13.25 to 13.75
Mixed hvy. cast	10.50 to 11.00

## BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	\$13.00
Scrap steel rails	\$13.50 to 14.00
Short shov. turnings	7.50
Stove plate	9.50
Steel axles	18.50
Iron axles	18.50
No. 1 RR. wrought	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	15.00
Tramcar wheels	14.50 to 15.00

## DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mtng. in-trial steel	\$10.00 to \$10.50
No. 2 hvy. mtng. steel	9.00 to 9.50
Borings and turnings	5.00 to 5.50
Long turnings	4.75 to 5.25
Short shov. turnings	5.75 to 6.25
No. 1 machinery cast	12.50 to 13.00
Automotive cast	13.00 to 13.50
Hvy. breakable cast	9.00 to 9.50
Stove plate	7.75 to 8.25
Hydraul. comp. sheets	11.25 to 11.75
New factory bushel	9.50 to 10.00
Sheet clippings	7.25 to 8.25
Flashings	9.50 to 10.00
Low phos. plate scrap	11.00 to 11.50

## NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mtng. steel	\$11.00 to \$11.50
No. 2 hvy. mtng. steel	8.50 to 9.00
Hvy. breakable cast	10.50 to 11.00
No. 1 machinery cast	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	15.00 to 15.50
Shafting	15.00 to 15.50
No. 1 RR. wrought	11.00 to 11.50
No. 1 wrought long	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	4.00 to 4.50
Cast borings*	3.50 to 4.00
No. 1 blast furnace	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50

Per gross ton, delivered local foundries:  
No. 1 machn. cast \$13.50 to \$14.00  
No. 2 cast \$10.50 to 11.00

\* \$1.50 less for truck loads.  
† Northern N. J. prices are \$2 to \$2.50 higher.

## BOSTON

Dealers' buying prices per gross ton:

Breakable cast	\$9.40
Machine shop turn	\$2.88 to 3.30
Mixed bor. & turn	2.25
Bun. skeleton long	7.65
Shafting	15.25 to 15.50
Cast bor. chemical	5.00 to 6.00
Per gross ton delivered consumers' yards:	
Textile cast	\$13.50 to \$14.00
No. 1 machine cast	13.00 to 14.00
Per gross ton delivered dealers' yards:	
No. 1 hvy. mtng. steel	\$11.75 to \$12.00
No. 2 steel	10.50 to 10.75

## PACIFIC COAST

Per gross ton delivered to consumer:  
No. 1 hvy. mtng. steel \$13.00 to \$13.50  
No. 2 hvy. mtng. steel 12.50 to 13.00

## CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mtng. steel	\$9.25 \$8.75
No. 2 hvy. mtng. steel	8.00 7.50
Mixed dealers steel	6.75 6.25
Drop forge flashings	8.25 7.75
New loose clippings	4.25 3.75
Busheling	3.75 3.25
Scrap pipe	4.25 3.75
Steel turnings	4.25 3.75
Cast borings	3.75 3.25
Machinery cast	14.00 13.50
Dealers cast	12.00 11.50
Stove plate	8.00 7.50

## EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mtng. steel	\$12.00 to \$12.50
No. 2 hvy. mtng. steel	10.50 to 11.00
No. 2 cast	10.50 to 11.00
Stove plate	9.50 to 10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mtng. steel	\$13.75 to \$14.00
No. 2 hvy. mtng. steel	12.75 to 13.00
Rails (scrap)	14.00 to 14.25

Philadelphia, delivered alongside boats, Port Richmond.

No. 1 hvy. mtng. steel	\$15.00 to \$15.25
No. 2 hvy. mtng. steel	13.50 to 13.75

## PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

### SEMI-FINISHED STEEL

#### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton  
Rerolling .....\$34.00  
Forging quality ..... 40.00

#### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton  
Open hearth or bessemer .....\$34.00

#### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.  
Grooved, universal and sheared .....1.90c.

#### Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton  
Pittsburgh, Chicago or Cleveland .....\$43.00  
Worcester, Mass. .... 45.00  
Birmingham ..... 43.00  
San Francisco ..... 52.00  
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

### SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham ..... 2.15c.  
Detroit, delivered ..... 2.25c.  
Duluth ..... 2.25c.  
Philadelphia, delivered ..... 2.47c.  
New York ..... 2.49c.  
On cars dock Gulf ports ..... 2.50c.  
On cars dock Pacific ports ..... 2.75c.

### RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham ..... 2.00c.  
On cars dock Tex. Gulf ports ..... 2.45c.  
On cars dock Pacific ports ..... 2.70c.

### BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. .... 1.80c. to 2.05c.  
Detroit, delivered ..... 1.90c. to 2.15c.  
On cars dock Tex. Gulf ports ..... 2.15c. to 2.40c.  
On cars dock Pacific ports ..... 2.50c.

### RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham ..... 1.70c. to 1.90c.  
Detroit, delivered ..... 1.80c. to 2.00c.  
On cars dock Tex. Gulf ports ..... 2.05c. to 2.25c.  
On cars dock Pacific ports ..... 2.35c.

### IRON BARS

Chicago and Terra Haute ..... 2.15c.  
Pittsburgh (refined) ..... 3.60c.

### COLD FINISHED BARS AND SHAFTING\*

Pittsburgh, Buffalo, Cleveland, Chicago, and Gary ..... 2.65c.  
Detroit ..... 2.70c.

\* In quantities of 10,000 to 19,999 lb.

### PLATES

Base per Lb.

Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c.\*  
Philadelphia, del'd ..... 2.05c. to 2.15c.  
New York, del'd ..... 2.19c. to 2.29c.  
On cars dock Gulf ports ..... 2.45c.  
On cars dock Pacific ports ..... 2.60c.  
Wrought iron plates, P'tg. .... 3.80c.

\* Subject to concessions, particularly in the East, of \$2 a ton.

### FLOOR PLATES

Pittsburgh or Chicago ..... 3.35c.  
New York, del'd ..... 3.71c.  
On cars dock Gulf ports ..... 3.70c.  
On cars dock Pacific ports ..... 3.95c.

### STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham ..... 2.10c.  
Philadelphia, del'd ..... 2.215c.  
New York, del'd ..... 2.27c.  
On cars dock Gulf ports ..... 2.45c.  
On cars dock Pacific ports ..... 2.70c.

### STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.  
On cars dock Gulf ports ..... 2.85c.  
On cars dock Pacific ports ..... 2.90c.

### RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton .....\$40.00  
Angle bars, per 100 lb. .... 2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton .....\$40.00  
Light rails (from rail steel) per gross ton ..... 39.00

Base per Lb.

Cut spikes ..... 3.00c.  
Screw spikes ..... 4.55c.  
Tie plates, steel ..... 2.15c.  
Tie plates, Pacific Coast ports. 2.25c.  
Track bolts, to steam railroads 4.15c.  
Track bolts to jobbers, all sizes (per 100 counts) ..... 65-5  
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

### SHEETS

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago ..... 2.00c.  
Detroit, delivered ..... 2.10c.  
Philadelphia, delivered ..... 2.17c.  
Granite City ..... 2.10c.  
On cars dock Pacific ports ..... 2.50c.  
Wrought iron, Pittsburgh ..... 4.10c.

Cold Rolled\*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago ..... 3.05c.  
Detroit, delivered ..... 3.15c.  
Granite City ..... 3.15c.  
Philadelphia, delivered ..... 3.37c.  
On cars dock Pacific ports ..... 3.65c.

\* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15.

Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham ..... 3.50c.  
Philadelphia, del'd ..... 3.67c.  
Granite City ..... 3.60c.  
On cars dock Pacific ports ..... 4.00c.  
Wrought iron, Pittsburgh ..... 6.10c.

### Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.

Field grade ..... 3.20c.  
Armature ..... 3.55c.  
Electrical ..... 4.05c.  
Motor ..... 4.95c.  
Dynamo ..... 5.65c.  
Transformer 72 ..... 6.15c.  
Transformer 65 ..... 7.15c.  
Transformer 53 ..... 7.35c.  
Transformer 52 ..... 8.45c.

Silicon Strip in coils—Sheet price plus still-com sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

### Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary.... 3.80c.  
F.o.b. cars dock Pacific ports. 4.50c.

### Vitreous Enameling Stock, 20 Gage\*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland ..... 3.35c.  
Detroit, del'd ..... 3.45c.  
Granite City ..... 3.45c.  
On cars dock Pacific ports ..... 3.95c.

### TIN MILL PRODUCTS

\*Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chicago and Gary .....\$5.00  
Standard cokes, Granite City.. 5.10

\* Prices effective Nov. 10 on shipments through first quarter of 1939.

### Special Coated Manufacturing Ternes

Per Base Box

Granite City .....\$4.10  
Pittsburgh or Gary ..... 4.30

### Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)  
8-lb. coating I.C. ....\$12.00  
15-lb. coating I.C. .... 14.00  
20-lb. coating I.C. .... 15.00  
25-lb. coating I.C. .... 16.00  
30-lb. coating I.C. .... 17.25  
40-lb. coating I.C. .... 19.50

### Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary 3.05c.  
Granite City ..... 3.15c.  
On cars dock Pacific ports, boxed ..... 4.00c.

### HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham 2.00c.  
Detroit, delivered ..... 2.10c.

### Cooperage Stock

Pittsburgh & Chicago ..... 2.10c.

From May 10 up to and including May 15, reductions in the base price of hot rolled strip running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15.

Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

### COLD ROLLED STRIP\*

Base per Lb.

Pittsburgh, Youngstown or Cleveland ..... 2.80c.  
Chicago ..... 2.90c.  
Detroit, delivered ..... 2.90c.  
Worcester ..... 3.00c.

\* Carbon 0.25 and less.

### Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland ..... 2.95c.  
Detroit, delivered ..... 3.05c.  
Worcester ..... 3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to \$4 a ton were prevalent. Concessions withdrawn on May 15.

### COLD ROLLED SPRING STEEL

Pittsburgh

and

Cleveland Worcester

Carbon 0.26-0.50% 2.80c. 3.00c.  
Carbon 0.51-0.75 4.30c. 4.50c.  
Carbon 0.76-1.00 6.15c. 6.35c.  
Carbon 1.01-1.25 8.35c. 8.55c.



## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

### To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

\* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

### To the Trade

	Base per Keg
Standard wire nails	\$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	\$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbed wire	3.30
Woven wire fence, base column	67
Single loop bale ties, base col.	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	\$2.62
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	\$2.80

Note: Birmingham base same on above items, except spring wire.

Add \$4 a ton for Mobile, Ala.; \$5 for New Orleans; \$6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are \$1 a ton additional in each case.

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills  
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld		Wrought Iron	
In.	Steel Black Galv.	In.	Black Galv.
1/2	56 36	1/2 & 3/4	+9 +30
3/4	59 42 1/2	1/2	24 6 1/2
1	63 1/2 54	3/4	30 13
1 1/4	66 1/2 58	1 & 1 1/4	34 19
1 1/2	68 1/2 60 1/2	1 1/2	38 21 1/2
2	72 1/2 64	2	37 1/2 21

Lap Weld		Wrought Iron	
In.	Steel Black Galv.	In.	Black Galv.
1/2	56 36	1/2 & 3/4	+9 +30
3/4	59 42 1/2	1/2	24 6 1/2
1	63 1/2 54	3/4	30 13
1 1/4	66 1/2 58	1 & 1 1/4	34 19
1 1/2	68 1/2 60 1/2	1 1/2	38 21 1/2
2	72 1/2 64	2	37 1/2 21

Butt weld, extra strong, plain ends		Wrought Iron	
In.	Steel Black Galv.	In.	Black Galv.
1/2	54 1/2 41 1/2	1/2 & 3/4	+10 +43
3/4	56 1/2 45 1/2	1/2	25 9
1	61 1/2 51 1/2	3/4	31 15
1 1/4	65 1/2 57 1/2	1 & 1 1/4	38 22 1/2
1 1/2	67 1/2 59	1 1/2	37 1/2 21

Lap weld, extra strong, plain ends		Wrought Iron	
In.	Steel Black Galv.	In.	Black Galv.
1/2	59 51 1/2	1/2 & 3/4	+10 +43
3/4	63 55 1/2	1/2	25 9
1	66 1/2 59	3/4	31 15
1 1/4	70 63 1/2	1 & 1 1/4	38 22 1/2
1 1/2	72 1/2 65 1/2	1 1/2	37 1/2 21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 4 in. and smaller.

### Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. 13 B.W.G.	\$ 9.01	\$ 7.82	....
1 1/4 in. o.d. 13 B.W.G.	10.07	8.26	....
1 1/2 in. o.d. 13 B.W.G.	11.70	10.23	\$9.72
1 3/4 in. o.d. 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2 1/4 in. o.d. 13 B.W.G.	16.76	14.54	13.79
2 1/2 in. o.d. 13 B.W.G.	18.45	16.01	15.16
2 3/4 in. o.d. 13 B.W.G.	20.21	17.54	16.58
3 in. o.d. 13 B.W.G.	21.42	18.59	17.54
3 1/2 in. o.d. 13 B.W.G.	22.48	19.50	18.35
3 3/4 in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4 1/2 in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

### Extras for less carload quantities:

	Base	5%	10%	20%	30%	45%	65%
10,000 lb. or ft. over	....	....	....	....	....	....	....
30,000 lb. or ft. to 39,999 lb. or ft.	....	5%	....	....	....	....	....
20,000 lb. or ft. to 29,999 lb. or ft.	....	....	10%	....	....	....	....
10,000 lb. or ft. to 19,999 lb. or ft.	....	....	....	20%	....	....	....
5,000 lb. or ft. to 9,999 lb. or ft.	....	....	....	....	30%	....	....
2,000 lb. or ft. to 4,999 lb. or ft.	....	....	....	....	....	45%	....
Under 2,000 lb. or ft.	....	....	....	....	....	....	65%

## CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	\$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra 4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$42, Birmingham, and \$50 delivered Chicago and 4-in. pipe, \$45, Birmingham, and \$54 delivered Chicago.

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
1/2 in. & 6 in. and smaller	68 1/2
Larger and longer up to 1 in.	66
1 1/2 in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3 and 7	68 1/2
Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:	
1/2 in. and smaller	67
9/16 in. to 1 in. inclusive	64
1 1/2 in. and larger	62

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities.

On all of the above items, there is an additional 5 per cent allowance for carload shipments.

	U.S.S.	S.A.E.
Semi-fin. hexagon nuts		
1/2 in. and smaller	67	70
9/16 to 1 in.	64	65
1 1/2 in. and larger	62	62

In full container lots, 10 per cent additional discount.

	72 1/2	12 1/2
Stove bolts in packages, nuts attached	72 1/2	12 1/2
Stove bolts in packages, with nuts separate	72 1/2	12 1/2
Stove bolts in bulk	84	84

On stove bolts freight is allowed to destination on 200 lb. and over.

### Large Rivets

(1/2 in. and larger)

	Base Per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$3.40

### Small Rivets

(7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 10

### Cap and Set Screws

(Freight allowed to destination)

	Per Cent Off List
Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread 1/2 in. and smaller	70
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67 1/2
Upset set screws, cup and oval points	75
Milled studs	60

## Alloy Steel

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, \$56.00 a gross ton.

### Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base .....2.70c. Delivered, Detroit .....2.80c.

	Alloy Differential
S.A.E. Series	per 100 Lb.
Numbers	
200 (1/2% Nickel)	\$0.35

2100 (1 1/2% Nickel)	\$0.75
2300 (3 1/2% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4340 Chr.-Ni.-Mo.	1.65
4345 Chr.-Ni.-Mo.	1.85
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. base per lb. Delivered Detroit, 3.45c., carlots.

## STAINLESS & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

### Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot Strip 17c.	17.50c.	24c.	35c.	35c.
Cold stp. 22c.	22.50c.	32c.	52c.	52c.

## TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 2c. a lb. higher.

## British and Continental

### BRITISH

Per Gross Ton  
f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	\$10 8s.
Beams, open-hearth	\$10 8s.
Channels, open hearth	\$10 5s.
Angles, open-hearth	\$10
Black sheets, No. 24 gage	\$13
Galvanized sheets, No. 24 gage	\$15 15s.

## CONTINENTAL

Per Gross Ton, Gold f.  
f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	\$5 10s.
Steel bars, merchant	\$5 5s.
Sheet Bars	Nominal
Plate 1/2 in. and up	\$5 7s.
Plate 3/16 in. and 5 mm.	\$5 13s.
Sheets 1/2 in.	\$5 9s. 6d.
Beams, Thomas	\$4 18s.
Angles (Basic)	\$4 18s.
Hoops and strip, base	\$5 12s.

# RAW MATERIALS PRICES

## PIG IRON

### No. 2 Foundry

F.o.b. Everett, Mass. ....	\$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md. ....	22.00
Delivered Brooklyn ....	24.50
Delivered Newark or Jersey City ....	23.53
Delivered Philadelphia ....	22.84
F.o.b. Neville Island, Erie, Pa. ....	21.00
Toledo, Chicago, Granite City, Cleveland and Youngstown... ..	21.00
F.o.b. Buffalo ....	21.00
F.o.b. Detroit ....	21.00
Southern, delivered Cincinnati ....	21.06
Northern, delivered, Cincinnati ....	21.44
F.o.b. Duluth ....	21.50
F.o.b. Provo, Utah ....	19.90
Delivered, San Francisco, Los Angeles or Seattle ....	24.50
F.o.b. Birmingham* ....	17.38

\* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

### Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

### Basic

F.o.b. Everett, Mass. ....	\$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md. ....	21.50
F.o.b. Buffalo ....	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown... ..	20.50
Delivered Philadelphia ....	22.34
Delivered Canton, Ohio ....	21.89
Delivered Mansfield, Ohio ....	22.44
F.o.b. Birmingham ....	16.00

### Bessemer

F.o.b. Buffalo ....	\$22.00
F.o.b. Everett, Mass. ....	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa. ....	23.00
Delivered Newark or Jersey City ....	24.53
Erie, Pa., and Duluth ....	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown ...	21.50
F.o.b. Birmingham ....	22.00
Delivered Cincinnati ....	22.11
Delivered Canton, Ohio ....	22.89
Delivered Mansfield, Ohio ....	23.44

### Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. ....	\$26.50
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### Gray Forge

Valley or Pittsburgh furnace... ..	\$20.50
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### Charcoal

Lake Superior furnace ....	\$25.00
Delivered Chicago ....	28.34

### Canadian Pig Iron

Per Gross Ton	
Montreal	
Foundry iron ....	\$24.50 base
Malleable ....	25.00 base
Basic ....	24.50 base
Toronto	
Foundry iron ....	\$22.50 base
Malleable ....	23.00 base
Basic ....	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

## FERROALLOYS

### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton	
Domestic, 80% (carload) ....	\$80.00

### Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21% ....	\$28.00
Domestic, 26 to 28% ....	33.00

### Electric Ferroalloy

Per Gross Ton Delivered; Lump Size	
50% (carload lots, bulk) ....	\$69.50*
50% (ton lots in 50 gal. bbl.) ..	80.50*
75% (carload lots, bulk) ....	126.00*
75% (ton lots in 50 gal. bbl.) ..	139.00*

### Bessemer Ferroalloy

F.o.b. Furnace, Jackson, Ohio Per Gross Ton	
10.00 to 10.50% ....	\$30.50
For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.	
For each unit of manganese over 2%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	

### Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50% ....	\$24.50
For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton. The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	
Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.	

### Ferrochrome

Per Lb.-Contained Cr., Delivered Carlots, Lump Size, on Contract	
4 to 6% carbon ....	10.50c.*
2% carbon ....	16.50c.*
1% carbon ....	17.50c.*
0.10% carbon ....	19.50c.*
0.06% carbon ....	20.00c.*

### Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract	
3% carbon ....	\$83.00
2.50% carbon ....	88.00
2% carbon ....	93.00
1% carbon ....	103.00

### Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads....	\$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovandium, contract, per lb. contained V., delivered .....	\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots .....	\$2.25†
Ferrocobalt, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton .....	\$142.50
Ferrocobalt, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton .....	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton .....	\$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville .....	\$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace .....	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace .....	80c.
Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo, f.o.b. Langeloth, Pa. ....	80c.

\* Spot prices are \$5 per ton higher.  
† Spot prices are 10c. per lb. of contained element higher.

## ORES

### Lake Superior Ores

Delivered Lower Lake Ports Per Gross Ton	
Old range, Bessemer, 51.50% ...	\$5.25
Old range, non-Bessemer, 51.50% ..	5.10
Messabi, Bessemer, 51.50% ....	5.10
Messabi, non-Bessemer, 51.50% ..	4.95
High phosphorus, 51.50% ....	4.85

### Foreign Ore

C.i.f. Philadelphia or Baltimore Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria .....	12c.
Iron, low phos., Swedish, average, 68½% iron .....	12c.
Iron, basic or foundry, Swedish, aver. 65% iron .....	11c.
Iron, basic or foundry, Russian, aver. 65% iron .....	Nominal
Man., Caucasian, washed 52% .....	29c.
Man., African, Indian, 44-48% .....	25c.
Man., African, Indian, 49-51% .....	28c.
Man., Brazilian, 46 to 48% .....	27c.

### Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered .....	\$18.00
Tungsten, domestic, scheelite delivered .....	\$15.00 to \$16.00
Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade) .....	\$15.00
Rhodesian, 45% ....	19.00
Rhodesian, 48% ....	22.00
Turkish, 48-49% ....	22.50
Turkish, 45-56% ....	19.50
Turkish, 40-41% ....	17.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50% .....	\$24.00
48-49% .....	23.50

## FLUORSPAR

Per Net Ton	
Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail .....	\$17.00
Domestic, f.o.b. Ohio River landing barges .....	\$18.00 to 19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines .....	18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid....	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....	31.50

## FUEL OIL

Per Gal.	
No. 2, f.o.b. Bayonne .....	\$3.875c.
No. 6, f.o.b. Bayonne .....	2.50c.
No. 5 Bur. Stds., del'd Chicago ..	3.25c.
No. 6 Bur. Stds., del'd Chicago ..	2.75c.
No. 3 distillate, del'd Cleve'd. ....	5.50c.
No. 4 industrial, del'd Cleve'd. ....	5.25c.
No. 5 industrial, del'd Cleve'd. ....	3.75c.
No. 6 industrial, del'd Cleve'd. ....	3.50c.

## COKE

Per Net Ton	
Furnace, f.o.b. Connellsville, Prompt .....	\$3.75
Furnace, f.o.b. Connellsville, Prompt .....	\$4.75 to 5.50
Foundry, by - product Chicago ovens .....	10.25
Foundry, by - product, del'd New England... ..	12.50
Foundry, by - product, del'd Newark or Jersey City .....	10.88 to 11.40
Foundry, by - product, Philadelphia .....	10.95
Foundry, by - product, delivered Cleveland ..	10.30
Foundry, by - product, delivered Cincinnati ..	9.75
Foundry, Birmingham ..	7.50
Foundry, by - product, del'd St. Louis industrial district .....	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports .....	14.75



# IRON AND STEEL WAREHOUSE PRICES

## PITTSBURGH\*

	Base per Lb.
Plates	3.40c.
Shapes	3.40c.
Soft steel bars and small shapes	3.35c.
Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.65c.
Hot rolled strip	3.60c.
Hot rolled sheets	3.35c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes (1 to 24 kegs)	3.60c.
Wire nails (in 100-lb. kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb.  
On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge.

All above prices for delivery within the Pittsburgh switching district.

## NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.74c.
Structural shapes	3.75c.
Soft steel bars, round	3.84c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.09c.
Flats up to 12 in. wide	4.09c.
Cold-rolled strip soft and quarter hard	3.51c.
Hot-rolled strip, soft O.H.	3.96c.
*Hot-rolled sheets (8-30 ga.)	3.40c.
Galv. sheets (24 ga.)	4.50c.
Long ternes (24 ga.)	5.50c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.60c.
Deep drawing	4.85c.
Stretcher leveled	5.10c.
SAE, 2300, hot-rolled	7.35c.
SAE, 3100, hot-rolled	5.90c.
SAE, 6100, hot-rolled annealed	8.75c.
SAE, 2300, cold-rolled	8.59c.
SAE, 3100, cold-rolled, annealed	8.19c.
Floor plate, 1/2 in. and heavier	5.56c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.70c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$2.90

\*For lots less than 2000 lb.

## CHICAGO

	Base per Lb.
Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.50c.
Soft steel squares, hexagons, channels and Tees	3.65c.
Hot rolled strip	3.60c.
Floor plates	5.15c.
Hot rolled sheets	3.35c.
Galvanized sheets	4.25c.
Cold rolled sheets	4.30c.
Cold finished carbon bars	3.75c.
Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.	

## CLEVELAND

	Base per Lb.
Plates	3.40c.
Structural shapes	3.58c.
Soft steel bars	3.25c.
Reinfor. bars (under 2000 lb.)	2.55c.
Cold-fin. bars (1000 lb., over.)	3.75c.
Hot-rolled strip	3.50c.
Cold rolled sheets	4.55c.
Cold-finished strip	3.20c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.35c.
Floor plates, 3/16 in. and heavier	5.18c.
*Black ann'd wire, per 100 lb.	\$5.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	5.85c.
Cold rolled alloy steel (3115)	6.75c.

\* For 5000 lb. or less.

† 500 lb. base quantity.

Prices shown on hot rolled bars, strip, sheets, shapes and plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

## ST. LOUIS

	Base per Lb.
Plates and structural shapes	3.47c.
Bars, soft steel (rounds and flats)	3.62c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.77c.
Cold fin. rounds, shafting, screw stock	4.02c.
Galv. sheets (24 ga.)	4.53c.
Hot rolled sheets	3.38c.
Galv. corrugated sheets, 24 ga. and heavier	4.58c.
Structural rivets	5.02c.

\* No. 26 and lighter take special prices.

## BOSTON

	Base per Lb.
Structural shapes, 3 in. and larger	3.85c.
Plates, 1/4 in. and heavier	3.85c.
Bars	3.83c.
Heavy hot rolled sheets	3.71c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.61c.
Galvanized sheets	4.61c.
Cold rolled sheets	4.71c.
The following quantity differentials apply: Less than 100 lb., plus \$1.50 per 100 lb.; 100 to 399 lb. plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb. minus 20c.; 10,000 to 39,999 lb. minus 30c.; 40,000 lb. and over minus 40c.	

## BUFFALO

	Base per Lb.
Plates	3.62c.
Floor plates	5.25c.
Struc. shapes	3.40c.
Soft steel bars	3.35c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	3.65c.
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl., also sizes No. 8 to 30 ga.	3.35c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.82c.

## NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

## REFRACTORIES PRICES

### Fire Clay Brick

	Per 1000 f.o.b. Works
Super-duty brick, at St. Louis	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1 Ohio	39.90
Ground fire clay, per ton	7.10

### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

### Chrome Brick

	Net per Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

### Magnesite Brick

	Net per Ton
Standard f.o.b. Baltimore and Chester	\$67.00
Chemically bonded, f.o.b. Baltimore	57.00

### Grain Magnesite

	Net per Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester in sacks	40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

## PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	3.40c.
*Structural shapes	3.40c.
*Soft steel bars, small shapes, iron bars (except bands)	3.60c.
†Reinforc. steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.11c.
*Steel hoops	4.10c.
*Steel bands, No. 12 and 3/16 in. incl.	3.60c.
*Spring steel	4.75c.
†Hot-rolled anneal. sheets	3.40c.
†Galvanized sheets (No. 24)	4.43c.
*Diam. pat. floor plates, 1/4 in.	5.00c.

These prices are for delivery in Philadelphia trucking area.

\*For quantities between 400 and 1999 lb.

†For 10 bundles or over.

‡For one to five tons.

## BIRMINGHAM

	Base per Lb.
Bars and bar shapes	3.50c.
Structural shapes and plates	3.55c.
Hot rolled sheets No. 10 ga.	3.35c.
Galvanized sheets No. 24 ga.	4.75c.
Strip	3.60c.
Reinforcing bars	3.50c.
Floor plates	5.88
Cold finished bars	4.43
Machine and carriage bolts	.50 & 10 off list
Rivets (structural)	\$4.60 base
On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 1999 lb. All prices are f.o.b. consumer plant.	

## PACIFIC COAST

	San Francisco	Los Angeles	Seattle
Plates, tanks and U. M.	3.45c.	3.80c.	3.40c.
Shapes, standard	3.45c.	3.80c.	3.50c.
Soft steel bars	3.50c.	3.80c.	3.65c.
Reinforcing bars, f.o.b. cars dock			
Pacific ports	2.275c.	open.	2.975c.
Hot-rolled sheets (No. 10)	3.45c.	4.00c.	3.70c.
Galv. sheets (No. 24 and lighter)	5.15c.	4.75c.	4.75c.
Galv. sheets (No. 22 and heavier)	5.40c.	4.75c.	4.75c.
Cold-finished steel			
Rounds	6.55c.	6.60c.	7.10c.
Squares and hexagons	7.80c.	7.85c.	7.10c.
Flats	8.30c.	8.35c.	8.10c.
Common wire nails—base per keg less carload	\$3.00	\$2.85	\$3.00

All items subject to differentials for quantity.

## ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.93c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## DETROIT

	Base per Lb.
Soft steel bars	3.33c.
Structural shapes	3.65c.
Plates	3.60c.
Floor plates	5.27c.
Hot-rolled sheets, 8 to 30 gages above 12 in. and 3/16 in., 24 in. to 48 in. wide	3.43c.
Cold-rolled sheets	4.50c.
*Galvanized sheets	4.59c.
Hot-rolled strip, under No. 12	3.68c.
Hot-rolled strip, No. 12 and over	3.43c.
Cold-finished bars	3.89c.
Cold-rolled strip	3.55c.
Hot-rolled alloy steel (SAE 3100 Series)	5.97c.
Cold-rolled alloy (SAE 2300)	8.45c.

Quantity extras apply to all items.

\*Price applies only in metropolitan Detroit.

## ... CANADA ...

### ... Steel and pig iron production trend upward

**T**ORONTO, June 27—Pig iron production in Canada in May reached a total of 57,746 gross tons against 46,254 tons in April, with the May rate being continued into June. Of this total, 33,000 tons was produced by Ontario furnaces and the remainder in Nova Scotia. Ingot and direct steel castings also showed a favorable gain for the month, with May output the highest since 1937.

The Aluminum Co. of Canada will erect a plant at Kingston, Ont., to cost \$4,500,000, this sum to take care of construction and equipment. Contract for 2200 tons of steel for the proposed plant has been awarded to Hamilton Bridge Co., Hamilton, Ont., at estimated cost of \$230,000. Announcement also is made that the Aluminum Co. of Canada is making substantial additions to buildings and equipment at its existing plants at Shawinigan Falls and Arvida, Que., the latter undertakings to cost \$3,500,000.

The Dominion Steel & Coal Corp., Sydney, N. S., is maintaining operations at capacity and will continue this rate for the next two months on current orders, with high operating schedules assured to the end of the year. The high operating rate for the Sydney steel mills largely is due to big export demand for steel from Great Britain, with other large contracts pending. The company's iron mines at Wabana, Newfoundland, are maintaining an annual output rate of 1,600,000 tons with ore shipments to Britain estimated to reach a total of close to a million tons this year. Other Canadian steel plants also are showing high operating schedules and report some betterment in the flow of orders for various lines of steel for domestic consumption.

## CAST IRON PIPE

Lincoln, Mass., is considering bids on 10,400 ft. of 8-in. pipe. Baker & Co., Hyde Park, Boston, is low bidder.

Procurement Office, Treasury Department, Boston, has placed a tonnage of 10-in. pipe for Georgetown, Mass., and 14-in. pipe for Everett, Mass., with Warren Foundry & Pipe Corp., Boston. Bids closed June 26 on 2340 ft. of 6-in. pipe for North Grafton, Mass.

North Kingston, R. I., is considering alternate bids on 29,600 ft. of 12-in. pipe, 8900 ft. of 10-in., 8400 ft. of 8-in., 10,500 ft. of 6-in., 200 ft. of 4-in., and 27 tons of fittings.

Jefferson County Water Control and Improvement District No. 1, Groves, Tex., E. L. Stewart, president, asks bids until July 8 for 1250 ft. of 8-in. pipe; also 150,000-gal. elevated steel water tank and tower, valves,

## A New Use for Scrap Quotations of The Iron Age

**D**ETROIT—A new application for THE IRON AGE published scrap quotations is being made in Detroit, effective July 1, when THE IRON AGE figures will go into use as a basis for intra-company billings of scrap offal. It has been learned that the General Motors Corp. will make a test of a stabilized quarterly figure based on THE IRON AGE quotation for low phosphorus punchings at Pittsburgh, less freight to the plant at which the scrap or offal originates. The practice is put in effect largely as a result of the increasing use of offal in minor automotive parts, braces, gussets, angles, etc. The corporation divisions and plants which produce larger stampings frequently ship usable scrap to other plants and divisions and the standardized price has become a necessity for book-keeping purposes.

pipe bends and other waterworks equipment.

Board of Public Works Commissioners, Charleston, S. C., and Quartermaster, U. S. Army, Fort Moultrie, S. C., plan joint construction of pipe line through Christ Church Parish, extending from point near Mount Pleasant to Fort Moultrie for water supply from Edisto River water source of city to last noted point. Cost close to \$1,000,000.

Board of Mission Township Commissioners, Topeka, Kan., care of O. J. Eidmann, 1319 High Street, Topeka, consulting engineer, plans pipe lines for water system in township, including main supply line from Topeka.

Olympia, Wash., plans about 15 miles, various sizes, for extensions and replacements in system. Cast iron and transite pipe will be used for different parts of project. Cost about \$101,800, of which \$92,834 will be furnished by municipality and remainder secured through Federal aid. Charles Williams is city engineer.

Tucson, Ariz., plans pipe line extensions in system and other waterworks installation. Cost about \$128,000. Financing has been arranged through Federal aid. P. J. Martin, Jr., is water superintendent.

Laurel, Mont., plans pipe line extensions and replacements in water system. Cost about \$36,000. Financing has been arranged through Federal aid.

Milltown, Wis., closes bids July 5 for 982 ft. of 6-in., 800 ft. of 2-in., and quantity of fittings; also for gate valves, hydrants, etc. Druar & Milinowski, Globe Building, St. Paul, Minn., are consulting engineers.

Orrville, Ohio, plans pipe line extensions in water system. Surveys and estimates of cost will be made by Hoover & Montgomery, 8 East Long Street, Columbus, Ohio, consulting engineers.

Snoqualmie, Wash., plans 4 and 6-in. pipe for water system; also other waterworks in-

stallation. Allen Hitchings, Arctic Building, Seattle, is consulting engineer.

Portland, Ore., has awarded 250 tons of 8-in. pipe to United States Pipe & Foundry Co., San Francisco.

Port Angeles, Wash., will use 250 tons of universal pipe in current water main project.

Seattle, Wash., has taken bids for Warren Avenue district water mains, requiring a good sized tonnage of cast iron pipe.

## ... PIPE LINES ...

Northern Natural Gas Co., Sioux City, Iowa, plans extensions in steel pipe line from Sioux City to Worthington, Minn., for natural gas transmission, including crossing Missouri River at first noted place.

Board of Public Works, Alexandria, Minn., asks bids until July 7 for extensions in pressure pipe line for municipal heating system. Burlingame, Hitchcock & Estabrook, Inc., Sexton Building, Minneapolis, Minn., is consulting engineer.

Bayou State Oil Corp., Houston, Caddo Parish, La., plans immediate construction of 4½-in. welded steel pipe line from Rodessa oil field, near Ida, La., to oil refinery at first noted place for natural gas transmission for processing for gasoline production at plant. Company has contracted with National Refining Co., operating in Rodessa field, for purchase of 1,500,000 cu. ft. of gas per day.

Bureau of Reclamation, Denver, closes bids July 6 for two 96-in., outside diameter, welded plate-steel outlet pipes for outlet works at Wickiup dam, Deschutes, Ore., project (Specifications 1250-D).

City Water Department, Tacoma, Wash., W. A. Kunigk, City Hall, superintendent, plans 21,200 ft. of 58-in. and 2387 ft. of 42-in. steel pipe for replacement of present main connecting lines at South Ninety-fourth Street and Park Avenue with standpipe at South Nineteenth and J Streets. Alternates will be asked for use of concrete pipe. Cost about \$576,200. Financing is being arranged through Federal aid.

Standard Oil Co. of Ohio, Midland Building, Cleveland, has let contract to Berea Engineering Co., same address, for about five miles of welded steel pipe in Cincinnati district, for gasoline transmission in conjunction with new bulk oil terminal to be built at latter place. Cost close to \$75,000.

General Purchasing Officer, Panama Canal, Washington, closes bids June 30 for 21,651 ft. of 6-in., 3168 ft. of 4-in. and 1020 ft. of 1-in. welded steel pipe.

Department of Public Safety, Municipal Building, Harrisburg, Pa., William T. DeHart, director, asks bids until July 11 for 99,700 ft. of 42-in. bituminous-lined or cement-lined steel pipe, or steel cylinder reinforced-concrete pipe, and 507 ft. of 36-in., similar lined, with alternate, or steel cylinder reinforced-concrete pipe, for new main water line from Clark Valley dam reservoir to connection with system at Seventh and Division Streets, Harrisburg; also for 42-in. gate valves and chambers, air valves and chambers, blow-offs, etc. (Contract 4). Gannett, Eastman & Fleming, Inc., 600 North Second Street, Harrisburg, is consulting engineer.

Southern Counties Gas Co., 810 South Flower Street, Los Angeles, has let contract to Pacific Pipeline Construction Co., Avenal, Cal., for new 16-in. steel pipe line in Colorado Avenue from Stanford Street to Lincoln Boulevard, Santa Monica, Cal. Cost about \$50,000.

## Imports at Philadelphia

**P**HILADELPHIA—The following iron and steel imports were received here during the past week: six tons of steel bands, 13 tons of steel bars and 128 tons of structural shapes from Belgium; 70 tons of structural shapes from France.



# ...NON-FERROUS...

... Copper fairly active here and abroad ... Lead demand unabated ... Spelter sales advance to 5906 tons.

NEW YORK, June 27—Despite the heightening of tension over developments in the Far East, the non-ferrous markets have given every evidence of a strong undertone all week. Part of this strength undoubtedly came from reports indicating that the consumption of non-ferrous metals was slowly improving and in some cases was in excess of current buying, suggesting that there has been a gradual eating away of consumers' stock piles. Copper buying

was in fair volume all week, although the sales totals fluctuated violently from day to day. The bulk of the week's purchases of the red metal was for early fall delivery. Quotations here are unchanged at 10c. per lb., delivered Connecticut Valley. This morning's foreign business was done in a range between 10.05c. and 10.075c., c.i.f., usual Continental ports, which is almost identical with the price prevailing a week ago. Some small trading has been done in the

open market at 9.95c. per lb., but this concession is not sufficiently large to attract important tonnages.

## Zinc

Purchases in the past week totaled 5906 tons against 4360 in the previous week, while shipments dipped slightly to 4323 tons from 4546 tons. The growing opinion that the present spelter price is at the "bottom" and that future moves will most likely be upward, has brought out fairly heavy forward buying. The past week's business involved metal for delivery well into September. Zinc trading in London has been fairly active all week. This morning's business there was done at 2.93c. per lb., for spot, three points below the price of a week ago. Domestic quotations remain unaltered at 4.89c. per lb., New York.

## Lead

Another week of excellent sales was recorded by lead sellers last week, and the first two days of the present week indicate that still another week of heavy buying is in the offing. The August books were opened this morning and the response has been surprisingly heavy. By noon today, one seller had already sold his day's intake. The heavy buying of the past several weeks has brought June coverage up to 95 per cent and July to 65 per cent. Domestic prices are unchanged at 4.85c. per lb., New York, while this morning's London price of 3.04c. per lb., on spot, represented a loss of four points from a week ago. Domestic output in May was 46,006 tons against 39,250 tons in April. Shipments were 40,124 tons against 37,903 tons, while at the end of May reserves amounted to 129,270 tons as compared with 123,394 tons at the end of April.

## Tin

There was a little more activity in the market in the past week in the form of miscellaneous carlot purchases, with nearby positions generally favored. Domestic prices were comparatively steady all week, but over the week-end a loss of 10 points was registered, making today's quotation 49c. per lb., New York, on prompt Straits, against 49.125c. a week ago. Nearby tin is still rather tight abroad, but here supplies are sufficient to meet current demand without difficulty. Cash standards were £229 15s. in London this morning, up £1 over a week ago.

## NON-FERROUS PRICES

Cents per lb. for early delivery

	June 21	June 22	June 23	June 24	June 26	June 27
Copper, Electrolytic <sup>1</sup>	10.00	10.00	10.00	10.00	10.00	10.00
Copper, Lake	10.00	10.00	10.00	10.00	10.00	10.00
Tin, Straits, New York	49.10	49.10	49.10	...	49.00	49.00
Zinc, East St. Louis <sup>2</sup>	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis <sup>3</sup>	4.70	4.70	4.70	4.70	4.70	4.70

<sup>1</sup> Delivered Conn. Valley. Deduct ¼c. for New York delivery. <sup>2</sup> Add 0.39c. for New York delivery. <sup>3</sup> Add 0.15c. for New York delivery.

## Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits pig	50.00c.	52.00c.
Copper, Lake	11.25c.	11.125c.
Copper, electro	11.125c.	11.125c.
Copper, Castings	10.75c.	10.875c.
*Copper sheets, hot-rolled	18.12c.	18.12c.
*High brass sheets	16.48c.	16.48c.
*Seamless brass tubes	19.23c.	19.23c.
*Seamless copper tubes	18.62c.	18.62c.
*Brass rods	11.85c.	11.85c.
Zinc slabs	6.15c.	6.90c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.85c.	5.70c.
Lead, bar	6.45c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt, 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	29.50c.	29.75c.
Babbitt metal, commercial grade	21.50c.	21.75c.

## Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.875c.	9.50c.
Copper, hvy. and wire	6.875c.	7.25c.
Copper, light and bottoms	6.00c.	6.25c.
Brass, heavy	4.125c.	4.625c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.00c.	7.50c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or comp. turnings	5.87c.	6.375c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.25c.	13.75c.
Zinc	2.125c.	3.375c.

## Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 12c. a lb. QUICKSILVER, \$90-\$92 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.25c. a lb.

\*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

# FABRICATED STEEL

... Lettings in small volume at 12,850 tons ... New projects slightly higher at 17,800 tons as against 15,700 tons last week ... Plate awards only 125 tons.

## NORTH ATLANTIC STATES AWARDS

- 3300 Tons, New York, William Howard Taft High School in Bronx, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 900 Tons, Queens, N. Y., bridge, Circumferential Highway, to Taylor-Fichter Co., New York.
- 850 Tons, New York, public school No. 31, to Lehigh Structural Steel Co., Allentown, Pa.
- 600 Tons, New Castle County, Del., Nemours Foundation Hospital, to American Bridge Co., Pittsburgh.
- 265 Tons, Putnam County, N. Y., Delaware Aqueduct, contract items 44 and 46, to Jones & Laughlin Steel Service, Inc., Long Island City, N. Y.
- 240 Tons, Springfield, Mass., addition to Moore Drop Forging plant, to Haarman Steel Co., Holyoke, Mass.
- 235 Tons, Windsor, Vt., State bridge, to American Bridge Co., Pittsburgh.
- 220 Tons, Franklin County, Pa., bridges, section 18, for Pennsylvania Turnpike Commission, to Bethlehem Steel Co., Bethlehem, Pa.
- 205 Tons, Paulsboro, N. J., heater exchange structure, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 200 Tons, Pittsburgh, River Avenue viaduct, to Fort Pitt Bridge Works Co., Pittsburgh.
- 190 Tons, Springfield, Mass., sewage treatment plant, to National Steel Products Co.
- 155 Tons, Thomson, Conn., bridge, to American Bridge Co., Pittsburgh.
- 120 Tons, Elmira, N. Y., repairs to Lake Street bridge, to American Bridge Co., Pittsburgh.
- 105 Tons, Pittsburgh, recreation building, to Levinson Steel Co., Pittsburgh.

## THE SOUTH

- 1600 Tons, Lawrenceburg, Tenn., transmission towers for TVA, to Blaw-Knox Co., Blawnox, Pa.
- 200 Tons, Morenci and Douglas, Ariz., Phelps Dodge Corp. buildings, to Midwest Steel & Iron Works, Denver.
- 160 Tons, Carter-Johnson Counties, Tenn., bridge, to Bristol Steel & Iron Co., Bristol, Tenn.
- 115 Tons, Ways, Ga., pier casings for Ogeechee River bridge, to Richmond Structural Steel Co., Richmond, Va.
- 100 Tons, Frankfort, Ky., State office auditorium, to International Steel & Iron Co., Evansville, Ind.

## CENTRAL STATES

- 420 Tons, Milford, Ohio, State bridge, to Fort Pitt Bridge Works Co., Massillon, through Contractors Finance Corp.
- 255 Tons, Madison County, Ill., bridge, to American Bridge Co., Pittsburgh.
- 250 Tons, Whiteside County, Ill., bridge, to American Bridge Co., Pittsburgh.
- 310 Tons, Milwaukee County, Wis., bridges, to C. Hennecke Co., Milwaukee.
- 210 Tons, Chicago, Lincoln school, to Fort Pitt Bridge Works Co., Pittsburgh.
- 210 Tons, Crestline, Ohio, State bridge, to Burger Iron Works, Akron, through G. B. Herring & Son, Mansfield.
- 181 Tons, Davenport, Iowa, W. T. Grant store, to Davenport Foundry & Machine Co., Davenport.
- 170 Tons, Toledo, Ohio, State crossing elimination, to Fort Pitt Bridge Works Co., Massillon, through C. B. Moon Co., Cleveland.
- 130 Tons, Urbana, Ill., natural resources building, to Duffin Iron Co., Chicago.

## WESTERN STATES

- 500 Tons, San Francisco, factory building for American Smelting & Refining Co., to Moore Dry Dock Co., Oakland, Cal.
- 160 Tons, Brewster, Wash., undercrossing, to Isaacson Iron Works, Seattle, through Norris Brothers, Burlington, Wash.
- 140 Tons, Los Angeles, towers for Department of Water and Power, to Pennsylvania Iron & Steel Co., Los Angeles.
- 135 Tons, Los Angeles, steel racks for Department of Water and Power, to Pennsylvania Iron & Steel Co., Los Angeles.

## PENDING STRUCTURAL PROJECTS NORTH ATLANTIC STATES

- 2600 Tons, Brooklyn, Mill Basin bridge MS-39-3-C, Shore Parkway.
- 1350 Tons, New York, 100,000 ft. curbing.
- 900 Tons, New York, office building for Aetna Life Insurance Co.
- 700 Tons, New York, theater building for New York Life Insurance Co.
- 700 Tons, Brooklyn, addition to public school No. 67.
- 400 Tons, Esperence, N. Y., State bridges.
- 372 Tons, Erie and Niagara Counties, N. Y., highway project R.C. 4045; bids close July 19.
- 292 Tons, Oswego County, N. Y., including 60 tons reinforcing steel, grade separation, project No. C. 39-5; Hockensmith Contracting Co., Albany, N. Y., low bidder (previously reported).
- 280 Tons, Hamilton County, N. Y., including 40 tons reinforcing steel, highway project R.C. 4017; Ellis G. De Lia & Co., New Hartford, N. Y., low bidder (previously reported).
- 275 Tons, Rome, N. Y., building.
- 225 Tons, Goshen, N. Y., State bridges RC-4033 and RC-4034.
- 225 Tons, Hornell, N. Y., channel improvements for U. S. Engineers.
- 225 Tons, Chevy Chase, Md., Wisconsin Dial Center for Chesapeake & Potomac Telephone Co.
- 225 Tons, Titusville, Pa., Oil Creek bridge.
- 200 Tons, Brooklyn, Shore Parkway bridge MS-39-14-A.
- 200 Tons, Brooklyn, bridge SS-39.6.

## NORTH ATLANTIC STATES

- 200 Tons, Cambridge, Mass., laboratory for Massachusetts Institute of Technology.
- 200 Tons, Bangor, Me., two schools.
- 165 Tons, Kenyons, R. I., railroad bridge.
- 165 Tons, Sharon, Pa., alterations to Buhl Hospital building.
- 160 Tons, Staten Island, New York, grade crossing elimination.
- 150 Tons, Long Island City, N. Y., building for Wheeling Corrugating Co.
- 150 Tons, Albany County, N. Y., including 50 tons reinforcing steel, highway project R.C. 4049.
- 132 Tons, Rensselaer County, N. Y., highway project, R.C. 4021; bids close July 19.
- 127 Tons, Erie County, N. Y., highway project R.C. 4050; bids close July 19.
- 110 Tons, Waterville, Conn., factory building for Blake & Johnson Co.
- 110 Tons, Malone, N. Y., Salmon River bridge.
- 108 Tons, Knightville, Mass., dam.

## THE SOUTH

- 600 Tons, Tennessee River bridge, Watts Bar Dam, for TVA.
- 500 Tons, San Antonio, Tex., overpass; bids in.

## CENTRAL STATES

- 1300 Tons, Cincinnati, superstructure, Sixth Street viaduct.

- 800 Tons, Chicago, armory; bids June 29.
- 750 Tons, Aurora, Ill., factory building, Western-Austin Co.; bids June 29.
- 650 Tons, Warren, Ohio, crane girders for Republic Steel Corp.
- 510 Tons, State of Indiana, five bridges; bids June 29.
- 475 Tons, Chicago, South Damen Avenue subway; bids in.
- 400 Tons, Chicago, Commonwealth - Edison Co., synchronous condenser house, Crawford Avenue; bids July 5.
- 250 Tons, Franklin County, Ohio, grade crossing elimination; bids July 7.
- 250 Tons, Portsmouth, Ohio, repairs to suspension bridge.
- 200 Tons, Youngstown, Ohio, Division Street bridge; bids July 1.
- 200 Tons, Valparaiso, Ind., bridge, No. 1820.
- 110 Tons, Martinsville, Ind., bridge, cont. No. 1823.
- 100 Tons, Chicago, Commonwealth - Edison Co., switch house, Fiske Avenue; bids in.

## WESTERN STATES

- 151 Tons, San Francisco, Outer Mission Junior High School; Anderson & Ringrose, San Francisco, low bidders.
- 150 Tons, McCall, Idaho, suspension bridges.

## FABRICATED PLATES AWARDS

- 125 Tons, Sonora, Cal., penstocks for Pacific Gas & Electric Co., to Western Pipe & Steel Co., San Francisco.

## PENDING PROJECTS

- 9000 Tons, Harrisburg, Pa., water supply system, contract No. 4; bids close July 11.
- 6000 Tons, Fresno, Cal., conduit pipe for Friant dam, Bureau of Reclamation, bids until Aug. 23.
- 2800 Tons, Toledo, Ohio, 10,200 ft. of 72-in. pressure main for division 1 of municipal intake line; bids July 19.
- 450 Tons, Austin, Tex., tainter gates, Lower Colorado River Authority; bids in.
- 372 Tons, Los Angeles, Hansen Dam gates; Hardie-Tynes Mfg. Co., Birmingham, Ala., low bidder.
- 300 Tons, Pollock, Cal., tunnel supports for Southern Pacific relocation (Specifications 861); bids July 14.

## SHEET PILING AWARDS

- 1100 Tons, New York, bulkhead, contract No. 5, to Carnegie-Illinois Steel Corp., Pittsburgh.
- 1100 Tons, Buffalo auditorium, to Bethlehem Steel Co., Bethlehem, Pa.

## PENDING PROJECTS

- 100 Tons, Alexander County, Ill., Mississippi River improvements for U. S. Engineers.
- Unstated Tonnage, Toledo, Ohio, municipal intake line.

## ... OBITUARY ...

EDWARD W. NEWMAN, for 21 years secretary-treasurer of Cleveland Aluminum Castings Co., Cleveland, died June 23 in Cleveland. For 12 years and during the World War he was purchasing agent for White Motor Co., Cleveland. He was 51 years old.



JOHN JACKSON, president, Simonds Gear & Mfg. Co., Pittsburgh, died June 24 at Pittsburgh. Mr. Jackson had been active in this company since its organization. He was 79 years old.



## Gray and Malleable Iron

(CONCLUDED FROM PAGE 23)

the air, shows no appreciable corrosion.

Other instances could be cited, but the foregoing are fair examples of the many cases at hand.

Among the many other valuable characteristics of these castings is that due to the method of manufacture internal strains are absent on the one hand and on the other, crystalline size is both uniform and small. Casting surfaces are smooth, impressions sharp, they can be cast to close tolerance, the modulus of elasticity is around 26,000,000 lb. per sq. in., the Brinell hardness will average 130, while the Charpy impact value is about 16.5 ft.-lb.

Through the addition of a small percentage of copper and molybdenum the yield point can be raised to an average of 43,000 lb. per sq. in. with an elongation in excess of 18 per cent.

Finally, it can be stated that because of its high mechanical properties accompanied by a toughness that appears to be inherent in this type of product, the ease with which it can be machined, its rust resistance properties,

the fact that its weight per cubic foot is 8 per cent less than steel, coupled with the fact that the metal can be cast into very intricate, small or large castings, the field for the product is indeed very wide. The castings are used predominately for parts in moving machines, such as for automobiles, which in 1938 used 52 per cent of the yearly output, the other 48 per cent being used for purposes such as tractors, railway work, car construction, agricultural implements; and also, in the textile industry, for bridge and highway railing posts and panels, for miscellaneous applications of a very diversified character, and particularly for parts that are to be subjected to severe abuse in service.

It unquestionably is true that there is a continual demand for higher quality materials. The manufacturer is insisting to a greater degree than ever before that each part of the machine or apparatus that bears his company's name shall be able to successfully deliver the service for which it was designed, in which particular it is believed that the malleable iron casting holds a very high position in the estimation of the consumer.

## Compactness Featured in New Materials Handling Apparatus

(CONCLUDED FROM PAGE 35)

for handling dies or rolls in and out of presses or rolling machines and for handling sheets to maintain convenient height for feeding presses. In the type illustrated, elevation is through hydraulic rams, powered by a hand operated single or two speed pump. It may also be furnished with a motor driven pump. The standard sizes range in capacity from 350 to 5000 lb.; platform widths from 18 to 36 in., and in lengths from 24 to 60 in. Lowered heights may be from 3¼ to 18 in. or more, and elevated heights as desired.

### Portable Shop Cranes

TWO types of portable shop cranes have recently been developed. Typical models are illustrated, but

through the use of welded steel construction various units can be tailor made to suit particular requirements. Both are hauled about and steered with a hand jack lift.

### Jack Lift System

A NEW Rollaway jack system has been announced by *Yale & Towne Mfg. Co.*, Philadelphia. The jack is used in conjunction with from one to 10 Re-Nu Top skid platforms. It is mounted on rubber tired wheels revolving on Hyatt bearings and having a narrow wheel tread to reduce handle whip. All main engaging members are of heat treated alloy steel. Handle has an equalizing spring enclosed inside the tube, forcing the handle upright when the platform is

elevated. The load can be either pushed or pulled. Lowering the load is under full control of the handle and no foot work is necessary to make the disconnection. A wide open prong pocket is set in front of the hole to guide the connecting skid platform.

The Re-Nu Top skid platform is a semi-live type, with the two wheels carried on Hyatt bearings. A welded sub-frame ties the unit into one whole, but allows replacement of any one or all planks without difficulty.

### Electric Hoists

A NEW, completely enclosed, cable and drum electric hoist, featuring double drum construction, push button control, electric brake and heavy duty construction throughout has recently been placed on the market by the *Conco Engineering Works*, Mendota, Ill. One worm gear and a pair of spur gears, the latter of high carbon steel, are used in the drive, and all the gear shafts are mounted on anti-friction bearings. Drums are 30 times cable diameter. The brake is a spring set, disk type operated by a heavy duty solenoid connected to the control circuit. The motor is a reversible type that can be removed even when the hoist is under load. The hoist is moderately priced.

A NOTHER electric hoist recently introduced covering the same range and higher is the so-called Quick-Lift hoist, made by the *Coffing Hoist Co.*, Danville, Ill. This chain hoist can be plugged into single or three-phase lines or d.c. circuits. Motor is a heavy duty ball bearing type of high starting torque, fully enclosed. The hoist is built with lubri-sealed ball bearings. Gears and pinions are made of heat treated alloy steel and run in a bath of oil. An extra heavy load chain is provided, said not to kink or bend. Sheave is cast steel. Brake is of shoe type, readily accessible at the end of the hoist. The rope pull operated controller has heavy duty contact points and is sensitive enough so that the load may be raised or lowered in fractions of an inch.

*Continental Steel Corp.* directors have declared a dividend of 25c. a share on the common stock and the regular quarterly dividend of \$1.75 a share on the preferred stock, both payable July 1, to stockholders of record June 15.

*William Lind Co.* announces the removal of its salesrooms and offices to 83-85 Worth Street, New York City.

# PLANT EXPANSION AND EQUIPMENT BUYING

## ◀ NORTH ATLANTIC ▶

**American Can Co.**, 230 Park Avenue, New York, has approved plans for one-story and part basement addition, 145 x 244 ft., to branch plant at Vernon, Los Angeles, to be used primarily for production of large containers. Cost about \$125,000 with equipment. J. F. Abbey is company construction superintendent in charge.

**Constructing Quartermaster**, U. S. Military Academy, West Point, N. Y., asks bids until July 14 for one 1500-hp. boiler unit in power house.

**Swift & Co.**, Union Stock Yards, Chicago, has asked bids on general contract for three-story and basement addition to branch plant at Schenectady, N. Y. Cost over \$50,000 with equipment. Eastern branch offices at 25 Faneuil Hall Square, Boston, in charge.

**Skid Fastener Corp.**, 55 Chrystie Street, New York, brass fasteners, has leased a floor in building at 97-99 Prince Street, for plant.

**American Cyanamid & Chemical Corp.**, 30 Rockefeller Plaza, New York, industrial chemicals, has let general contract to Miller-Davis Co., Kalamazoo, Mich., for new plant at Kalamazoo, comprising several one and multi-story units. Cost about \$300,000 with equipment. It will replace a present plant at same place, providing larger capacity. L. R. Verdon is company manager at Kalamazoo.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 11 for power-actuated portable tools for Staten Island, New York (Schedule 6597); until July 7, pinions, racks, ball bearings, idler gear shafts, keys, etc. (Schedule 6598) for Brooklyn and Philadelphia Navy yards.

**G. F. Harvey Co.**, Wells Street, Saratoga Springs, N. Y., drug and chemical products, has asked bids on general contract for two-story and basement addition. Cost close to \$50,000 with equipment.

**Crouse Laboratories, Inc.**, 42 Hedden Place, East Orange, N. J., manufacturer of mobile airport equipment, consisting of a complete machine shop unit for aircraft and airplane engine repairs, with field-lighting equipment and radio apparatus, etc., has leased former building of Watts-Campbell Co., 282-304 Passaic Street, Newark, N. J., for plant. Present works will be removed to new location and capacity increased. Main plant of company is at Taos, N. M. Webster Wrenn will be manager of Newark plant.

**Eclipse Aviation Corp.**, Foundry Division, 1265 McBride Avenue, West Paterson, N. J., manufacturer of aluminum castings, parts and accessories for airplanes, plans rebuilding part of plant, including heat-treating department, recently destroyed by fire. Loss close to \$40,000 with equipment. Company is affiliated with Bendix Aviation Corp., Bendix, N. J.

**Commanding Officer**, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until July 5 for six motor-driven drill presses (Circular 950); until July 6, one automatic multiple-spindle screw machine (Circular 905), four spinning machines (Circular 954), 500 extruded aluminum bodies for non-detachable breech cap signal (Circular 956); until July 7, one centerless grinder (Circular 918), one detonator cup machine and tooling (Circular 917), music wire (Circular 963), six saws, six sets of geometric chasers, eight solid hobs and six shell-type hobs (Circular 919), one high precision boring and measuring machine (Circular 916), 175,000 small aluminum die-castings for manufacturing booster cup for booster (Circular 979), machine taps (Circular 975); until July 10, one vertical shaper, two toolroom precision lathes, and additional tools and equipment (Circular 924).

**Central Jersey Farmers' Cooperative Association, Inc.**, Hightstown, N. J., Ely Bloch,

president, has asked bids on general contract for new grain elevator and mill. Cost over \$50,000 with elevating, conveying, screening and other mechanical equipment. E. C. Machin, Commonwealth Building, Allentown, Pa., is engineer.

**Bureau of Yards and Docks**, Navy Department, Washington, will prepare plans soon for one-story projectile loading plant building at ammunition depot, Fort Mifflin, Pa. Cost \$45,000 with equipment. Appropriation in that amount has been authorized.

**Quartermaster Depot**, Twenty-first and Johnston Streets, Philadelphia, asks bids until July 10 for special machine parts; also parts for sewing machines (Circular 669-257).

**Royal Screw & Machine Works**, 610 Cherry Street, Philadelphia, machinery and parts, plans one-story addition to plant at Sixth and Brown Streets. Cost close to \$40,000 with equipment. William P. Schmid, Otis Building, is engineer.

**Commanding Officer**, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until July 5 for two motor-driven, vertical, rough and finish shell-turning automatic machines for 3-in., 75-mm. and 90-mm. shells (Circular 1359), three horizontal, precision-type, motor-driven bench milling machines (Circular 1368).

## ◀ BUFFALO DISTRICT ▶

**Fruehauf Trailer Co.**, 10940 Harper Street, Detroit, manufacturer of motor trailers and parts, has asked bids on general contract for one-story factory branch, storage and distributing plant at Illinois, Indiana and Perry Streets, Buffalo. Cost reported over \$50,000 with equipment. Buffalo offices are at 106 Michigan Avenue.

**Spaulding Fibre Co., Inc.**, Wheeler Street, Tonawanda, N. Y., manufacturer of fiber tubes, rods, machined parts, etc., plans two-story addition, 60 x 100 ft. Cost about \$55,000 with equipment.

**General Mills, Inc.**, Chamber of Commerce Building, Minneapolis, Minn., has asked bids on general contract for new nine-story branch plant, 76 x 316 ft., on Michigan Avenue, Buffalo, for production of cereal products, flour, etc. Cost about \$1,800,000 with machinery. Structure will adjoin present plant of Washburn-Crosby Flour Mills, an affiliated organization. McNary & Kraft, Rand Tower Building, Minneapolis, are architects.

## ◀ SOUTH CENTRAL ▶

**Enterprise Foundry Co.**, East B Street, Belleville, Ill., manufacturer of stoves, furnaces and parts, is negotiating with city officials at Lexington, Tenn., for new plant at that place, to occupy one-story building to be built by municipality and secured under long-term lease. Cost close to \$100,000 with equipment.

**Director of Purchases**, Tennessee Valley Authority, Knoxville, Tenn., asks bids until July 3 for one 120-ton gantry crane at hydro-electric power plant, Hiwassee dam, N. C.; until July 6, intake gate hoist, same location; rubber-insulated wire and cable for power, control, heating and lighting circuits for Chickamauga project; until July 7, one rocking-type electric furnace with cold charge capacity of 3000 lb. and molten charge of 7000 lb., for refining service by department of chemical engineering, Wilson dam, Ala.

**Evangeline Packing Co.**, Lafayette, La., recently organized, has asked bids on general contract for new meat-packing plant. Cost over \$50,000 with equipment. P. J. Voorhies, Lafayette Lumber Co., Lafayette, is interested in new company.

**United States Engineer Office**, Vicksburg, Miss., asks bids until July 6 for 900 steel rod screw anchors (Circular 263).

## ◀ NEW ENGLAND ▶

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 7 for four motor-driven turret lathes (Schedule 6559), four motor-driven turret lathes and bar equipment (Schedule 6573) for Boston Navy Yard; copper-nickel alloy condenser tubes (Schedule 6547) for Boston, Charleston and Puget Sound yards; steel forgings and alloy steel forgings (Schedule 6563) for Newport, R. I., naval station.

**Stokely Brothers & Co.**, 2002 South East Street, Indianapolis, food packers and canners, have acquired former textile plant of Whitman Mills, New Bedford, Mass., consisting of several one and multi-story buildings, and will remodel for new branch plant, providing facilities for about 2000 employees. Cost over \$100,000 with machinery.

**Coca-Cola Bottling Co., Inc.**, 68 Woodbridge Street, New London, Conn., has asked bids on general contract for new one and two-story mechanical-bottling plant, 62 x 105 ft., in Town Hill district. Cost close to \$50,000 with equipment. Jesse M. Shelton, 133 Luckie Street, N.W., Atlanta, Ga., is architect.

**Commanding Officer**, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until July 5 for 16,500 operating rod springs (Circular 482), one motor-driven, high-speed sensitive drilling machine (Circular 485), two small motor-driven automatic milling machines (Circular 468); until July 6, two semi-automatic rotary swaging machines (Circular 486).

## ◀ WASHINGTON DIST. ▶

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until July 12 for two 40-ton and one 5-ton bridge cranes, and six 5-ton wall cranes for Norfolk Navy Yard. (Specification 9170). Bids have been asked on general contract for superstructure for one-story gun assembling shop at Washington yard (Specification 9067).

**Southern Maryland Tri-State Cooperative Association**, Welcome, Md., Wendell M. Reed, president, plans new steam-electric power plant for power supply for rural electric system. Fund of \$160,000 has been secured through Federal aid for station and line construction.

**General Purchasing Officer**, Panama Canal, Washington, asks bids until July 6 for seven motor-driven electric arc welding sets, and one gasoline or diesel engine-driven electric arc welding set (Schedule 3494); until July 7, steel machine bolts, carriage bolts, nuts, rivets, machine screws, iron or steel plate washers, and 100,000 lb. steel track spikes (Schedule 3497), wrought iron chain, pressure and compound gages, socket wrenches, nozzles, hand lubricating guns, etc. (Schedule 3496).

**Milton W. Bosley Co.**, Bayard and Nanticoke Streets, Baltimore, manufacturer of moldings for electric wiring and allied products, plans one-story addition, 60 x 150 ft. Cost over \$45,000 with equipment.

**Division of Purchases**, Sales and Traffic, Department of Agriculture, Washington, asks bids until July 7 for equipment for new center departmental laboratory, National Agricultural Research Center, Beltsville, Md., including pumps, air compressors, motors, preheaters, dehumidifier units, fans, water meters and other equipment (Circular 6341).

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 7 for steel and brass machine screws (Schedule 6589) for Norfolk Navy yard; until July 11, two grinders, with equipment (Schedule 6583), one vertical surface grinder (Schedule 6585), grinder (Schedule 6586), all motor-driven, for Alexandria, Va., yard; steel welding rods (Schedule 6556), welding rods and electrodes (Schedule 6557) for Eastern and Western yards; 53 sets of drawing instruments (Schedule 6582) for Washington yard.

## ◀ SOUTH ATLANTIC ▶

**Merrill-Stevens Dry Dock Co.**, 1270 N.W. Eleventh Street, Miami, Fla., plans new boat-building and repair works at N.W. Seventeenth Avenue and waterfront, with main one-story shop, 150 x 220 ft., and storage yard



adjoining. Cost close to \$80,000 with equipment. Alexander M. Balfé is general manager.

**Reliance Fertilizer Co.**, Louisville Road, Savannah, Ga., is considering rebuilding part of plant recently destroyed by fire. Loss close to \$175,000 with equipment.

**Albany Coca-Cola Bottling Co.**, Albany, Ga., has low bid on general contract from A. C. Knight, Albany, for new one-story mechanical-bottling plant. Cost about \$50,000 with equipment. Robert & Co., Bona Allen Building, Atlanta, Ga., are architects and engineers.

## ◀ SOUTHWEST ▶

**St. Louis-Southwestern Railway Co.**, 408 Pine Street, St. Louis, plans extensions and improvements in car and locomotive shops at Pine Bluff, Ark., including several one-story additions and equipment. Cost over \$80,000 with equipment. This is part of 1939 expansion and improvement program to cost about \$1,000,000.

**Ben Franklin Refining Co.**, Tulsa, Okla., an interest of Bell Oil & Gas Co., same address, has approved plans for expansion and betterments at gasoline refinery, Ardmore, Okla., including new cracking unit with daily capacity of about 2000 bbl., and auxiliary equipment. Steel tank storage facilities will be increased. Cost over \$75,000 with equipment.

**City Council**, Rockport, Mo., plans extensions and improvements in municipal diesel-electric generating plant, including additional equipment. Cost about \$45,000. A. Y. Taylor & Co., Central Building, Clayton, Mo., are consulting engineers.

**Socony-Vacuum Oil Co., Inc.**, 4140 Lindell Boulevard, St. Louis, has let general contract to B. C. Wagner, 4485 Olive Street, for new bulk oil storage and distributing plant with steel tank storage units and other facilities. Cost close to \$100,000 with equipment.

**O. H. Grissom**, Longview, Tex., is at head of project to build a new iron ore reduction plant in east Texas, consisting of one-story buildings, furnace units, power house and other structures. Natural gas will be used for operation. Cost over \$200,000. Financing is being arranged. H. P. McGaughey, Gilmer, Tex., and M. J. Harvey, Tyler, Tex., are interested in new company.

**Joaquin Independent School District**, Joaquin, Tex., will take bids soon on general contract for one-story vocational building at local school, 95 x 130 ft. Financing has been arranged through Federal aid. Stanley Brown, Davidson-Blaylock Building, Marshall, Tex., is architect.

## ◀ WESTERN PA. DIST. ▶

**J. P. Ward Foundry Co.**, Blossburg, Pa., machinery castings, etc., has approved plans for one-story foundry to replace structure destroyed by fire several months ago. Cost close to \$100,000 with equipment.

**Gulf Refining Co.**, Gulf Building, Pittsburgh, plans new bulk oil storage and distributing plant on 28-acre tract on Manufacturers Road, Chattanooga, Tenn., fronting on Tennessee River. It will comprise several buildings, with steel tank storage units, pumping station, etc. Cost over \$85,000 with equipment.

**Pittsburgh Coal Co.**, Oliver Building, Pittsburgh, is considering rebuilding tipple at coal-mining properties near Coal Run, Pa., recently destroyed by fire. Loss over \$65,000 with equipment.

## ◀ OHIO AND INDIANA ▶

**East Dayton Tool & Die Co.**, 310 East Second Street, Dayton, Ohio, will take bids soon on general contract for new two-story and basement plant in McCook field district, 80 x 125 ft. An air-conditioning system will be installed. Cost about \$65,000 with equipment. Walter Theis, Mutual Home Building, is architect.

**Sterling Foundry Co.**, Clysby Street, Wellington, Ohio, gray iron castings, has let contract to Austin Co., Cleveland, for plans and erection of one-story addition, 70 x 100 ft., for expansion in molding department, and improvements in present plant. Cost over \$60,000 with equipment.

**Automatic Washer Co.**, Newton, Iowa, laundry equipment and parts, has purchased plant and business of Prima Mfg. Co., Sidney, Ohio, manufacturer of allied equipment. Sidney works will be removed to Newton, where operations will be expanded and consolidated.

**B. F. Goodrich Co.**, Akron, Ohio, automobile tires, tubes, etc., will close bids on general contract July 12 for new branch mill at Clarksville, Tenn., to be used exclusively for production of mechanical rubber goods. It will consist of a main one-story unit, 200 x 800 ft., with power house, service and garage building, and other structures. Cost close to \$1,500,000 with equipment.

**Harris Mineral Water Co.**, 7946 North High Street, Columbus, Ohio, will take bids soon on general contract for one-story addition, 80 x 80 ft., to mechanical-bottling works. Cost over \$40,000 with equipment. D. A. Carmichael, 5 East Long Street, is architect.

**Indiana Farm Bureau Co-operative Association, Inc.**, 309 West Washington Street, Indianapolis, plans new fertilizer plant on 16-acre tract at Belmont Avenue and State Road 67, with power house, storage and distributing buildings and other structures. Cost about \$150,000 with equipment.

**Board of Public Works**, Rushville, Ind., asks bids until July 6 for extensions and improvements in municipal electric power plant, including new cooling tower, combustion control apparatus, boiler room equipment, etc. Bevington-Williams, Inc., Indiana Pythian Building, Indianapolis, is consulting engineer.

## ◀ MICHIGAN DISTRICT ▶

**Paranite Wire & Cable Corp.**, 14310 Woodward Avenue, Detroit, insulated wire and cable, a subsidiary of Essex Wire Corp., same address, has acquired property at Twenty-sixth and Adams Streets, Marion, Ind., improved with one-story buildings, and will remodel for new plant, operating in conjunction with works at Jonesboro, Ind. Cost about \$75,000 with equipment.

**Millcraft Products Co.**, Corunna, Mich., custom-built trailers, parts, etc., has taken over former mill of Burton Feed Mixer Co., Owosso, Mich., and will remove present works to new location and increase capacity. Facilities will be provided for output of about four to five complete trailers weekly.

**City Council**, Bessemer, Mich., has plans for new municipal electric power plant, following recent decision of State Supreme Court permitting project. Installation will include two diesel engine-generator units, each about 320-kw. capacity, two 15,000-gal. fuel oil tanks, pumping machinery and auxiliary equipment. Cost about \$185,000. Financing has been arranged through Federal aid. Ayres, Lewis, Norris & May, Ann Arbor, Mich., are consulting engineers.

## ◀ MIDDLE WEST ▶

**Sun Mfg. Co.**, 3012 North Clayburn Street, Chicago, automotive testing equipment and parts, will ask bids soon on general contract for new one-story plant on Avondale Avenue. Cost close to \$60,000 with equipment. William F. McCaukey, 3 South Prospect Street, Park Ridge, Ill., is architect.

**Western-Austin Co.**, Farnsworth Avenue, Aurora, Ill., manufacturer of road machinery and other heavy equipment, is arranging call for bids for two additions, one-story, 150 x 251 ft., for raw material storage and distribution, and one-story, 120 x 520 ft., for an assembling unit. Both structures will be of all-welded rigid steel frame type. Cost about \$275,000 with equipment, which will include electric cranes, hoists and other mechanical-handling apparatus. E. O. Sessions & Co., 120 South LaSalle Street, Chicago, are consulting engineers.

**A. E. Staley Mfg. Co.**, Decatur, Ill., starch, oils and allied products, has let general contract to Hettelsater Construction Co., Mutual Building, Kansas City, Mo., for addition, 52 x 100 ft., 50-ft. high, for storage and distribution, and mechanical-dryer department. Cost over \$50,000 with machinery. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are consulting engineers.

**Commanding Officer**, Ordnance Department, Rock Island Arsenal, Rock Island, Ill., asks bids until July 10 for five to 35 heavy-duty tractors, full track-laying, powered with diesel engine units (Circular 806).

**Board of Town Trustees**, La Porte City, Iowa, asks bids until July 11 for 450-500-hp. diesel engine-generator unit, exciter, exhaust silencer, fuel oil tank and other equipment for municipal power plant. Young & Stanley, Inc., Muscatine, Iowa, is consulting engineer.

**Bureau of Reclamation**, Denver, asks bids until July 7 for ventilating and air-conditioning equipment for Elephant Butte hydro-electric power plant, Rio Grande project, New Mexico-Texas (Specification 1252-D).

**Board of Education**, 228 North LaSalle Street, Chicago, has plans for new two-story vocational school in South Side district. Cost about \$150,000 with equipment. John C. Christensen is architect for board.

## ◀ PACIFIC COAST ▶

**Ducommun Metals & Supply Co.**, 219 South Central Avenue, Los Angeles, has asked bids on general contract for new one-story storage and distributing plant at Alameda and Fortyninth Streets, Vernon, where six-acre tract was acquired recently. It will consist of a main one-story structure, 290 x 600 ft., with one-story building adjoining, 20 x 400 ft., for auxiliary service. Five traveling cranes will be installed with other mechanical-handling equipment. Cost about \$300,000 with equipment. Albert C. Martin, Higgins Building, is architect.

**Bureau of Yards and Docks**, Navy Department, Washington, has asked bids (no closing date stated) for three-story paint shop, 60 x 280 ft., at Mare Island Navy Yard, with boiler and transformer house (Specifications 8994).

**Sulak Mfg. Co.**, Kulien Building, Seattle, manufacturer of precision machinery and parts, plans one-story factory in industrial district of city for parts production and assembling. Cost over \$45,000 with equipment.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 7 for three motor-driven milling machines and spare parts (Schedule 6544), electric arc welding sets and spare parts (Schedule 6548), three motor-driven precision toolmaker's geared-head lathes, with equipment, spare parts, tools, wrenches, etc. (Schedule 6543) for Mare Island Navy Yard.

**Purex Corp.**, 9300 Rayo Avenue, South Gate (Los Angeles), washing powders, cleansers, etc., has let general contract to Noel H. Calhoun, 845 Highland Avenue, Los Angeles, for one-story addition, totaling about 11,000 sq. ft. of floor space. Cost over \$40,000 with equipment. W. M. Bostock, 6221 Pacific Boulevard, Huntington Park, Cal., is engineer.

**Bureau of Reclamation**, Denver, asks bids until July 5 for racks, rack-operating mechanisms and elevator hoists for dams Nos. 2, 3 and 4, for control of migratory fish at Leavenworth Station, Columbia Basin project, Wash. (Specifications 1248-D); until July 6, two radial gates and one radial gate hoist for dam No. 2, same project (Specifications 1249-D).

## ◀ FOREIGN ▶

**North Metropolitan Electric Power Supply Co.**, Brimsdown, Enfield Wash, England, plans addition to electric generating plant at Millmarsh Lane, making third station unit, with installation of turbo-generators, high-pressure boilers and auxiliary equipment. Cost close to \$4,500,000.

**Department of Engineering Education**, Sydney Technical College, Sydney, New South Wales, Australia, plans early erection of new engineering trades school. Cost over \$550,000 with tools and equipment.

**Aluminum Co. of Canada, Ltd.**, Montreal, has approved plans for new plant at Kingston, Ont., for production of structural shapes, moldings, tubing and other aluminum products, comprising several one-story units, for large output. Company has also authorized expansion and improvements in plants at Arvida and Shawinigan Falls, Que., including equipment. Entire program is scheduled for completion in May, 1940. Company is a subsidiary of Aluminum Co. of America, Inc.

# THIS WEEK'S MACHINE ... TOOL ACTIVITIES ...

*... June orders at Cincinnati are below those of May, a record month ... Better volume seen at Chicago and New York ... Factories busy, with backlogs extending into 1940 in some instances.*

## June Orders Running Under Those of May

CINCINNATI—June has brought sharper gyrations in machine tool demand than any month of the current year. Currently, the demand in the past week was off again from the level of the preceding period, which would make the month of June so far at a trifle lower level than the average bookings were in May. Lathes are most noticeable in the sharp fluctuations; in fact, it is the result of a sharp decline in lathe demand during the past week that has brought the market level lower. Other tools, however, are in fairly well sustained demand, although manufacturers indicate that there is plenty of room for improvement. Despite this, plant operations are being well sustained and in many instances backlogs are sufficient to carry current production during the remainder of this year and in some instances well into the next year. Deliveries are beginning to trouble manufacturers, since a fair number of present orders were placed on shorter than customary shipping instructions. Some plants report that movement of finished machines is, in some instances, being delayed from one to three weeks because of crowding of shops and difficulty in obtaining castings promptly. The casting situation, however, is not the result of an over-burdened melt, but rather the attempt of foundry operators to accommodate new business and operations to such a level as will reasonably insure fair return on orders.

## Arsenal and Navy Yard Purchases in New England

BOSTON—The Government has purchased four turret lathes for the Boston Navy Yard, two duplex spline milling machines, 23 welding tools and miscellaneous machinery equipment for the Springfield Armory, and a multiple tool lathe for the Watertown Arsenal.

## New Orders at Chicago; Rockford Backlogs High

CHICAGO—Since last week a number of orders have been received by local machine tool sellers, and a more optimistic attitude is being expressed. Several machines have been purchased by the Milwaukee tractor plant of International Harvester Co., and buying is looked for at any time from the Chicago tractor works of this company. The Rock Island Arsenal is still issuing inquiries for machine tools, and now has quite a sizable list pending. Nearly all machine tool builders' plants in Rockford are busy

currently. Foreign and Government business are responsible for much of the activity, but a fair amount of private demand is apparent also. Deliveries from Rockford plants extend to the end of October in many cases, thus assuring good production throughout the summer.

## Deliveries at High Rate During Model Changeovers

DETROIT—Automotive buying of tools, dies and machinery, which is practically a year-round activity (in some phase or other) is temporarily eclipsed

while truckloads of equipment are moved into plants engaged in model change-over activity. With four plants already closed and two more closing this week, the industry is well along on this phase of its program. However, Detroit and the automobile industry is faced by possibility of a strike of CIO tool makers against General Motors Corp. in an attempt to get the union label put on all tools, dies, jigs and fixtures.

## Diversified Volume Featured In Metropolitan Market

NEW YORK—Dealers continue to be encouraged by the amount of diversification of present orders, indicating greater buying activity on the part of general industry, which had been dormant up until this month. For the present there is a distinct lull in purchasing of machine tools on the part of the aircraft parts industry. In dollar volume the new business is not great, although the number of units sold is substantial. Some dealers are not sharing in this business, although they report many quotations active. On the other hand, one dealer did a normal month's volume of business in the first half of June. The outlook for the summer months is more encouraging than it was a few weeks ago.

## ... GREAT BRITAIN ...

*... Scrap shipments of 500,000 tons to be spread over rest of year.*

LONDON, June 27 (By Cable)—According to official reports, the bulk of the International Scrap Convention's recent additional purchase of 500,000 tons of American scrap destined for United Kingdom will be spread over the remainder of the year.

The ease in demand for British steel is attributed to the fact that the Government and other large consumers have now placed the majority of the next few months' requirements, while the continuance of international uncertainties precludes the broadening of exports.

Heavy production in most departments is assured for several months. Sheet mills are fully occupied at least for six months.

There are further substantial purchases of Continental semi-finished steel, assuring continuity of sheet rolling.

A big demand for hematite pig iron is anticipated after the end of June when a 5s. reduction will be in force.

The Continent reports stable conditions as regards prices but some easing in general demand. The mills are

well placed for several months. Japan has bought a large quantity of Continental sheet bars.

Iran has placed 40,000 metric tons of rails with the Rail Cartel.

Tin plate is quieter, but makers' order books are well filled and prices are firm. Tin plate and black plate output in the United Kingdom in April totaled 68,000 tons and galvanized sheets amounted to 76,200 tons.

Balfour Beatty has secured a contract for £900,000 for flood relief work on the Euphrates River in Iraq, which involves the construction of two canals.

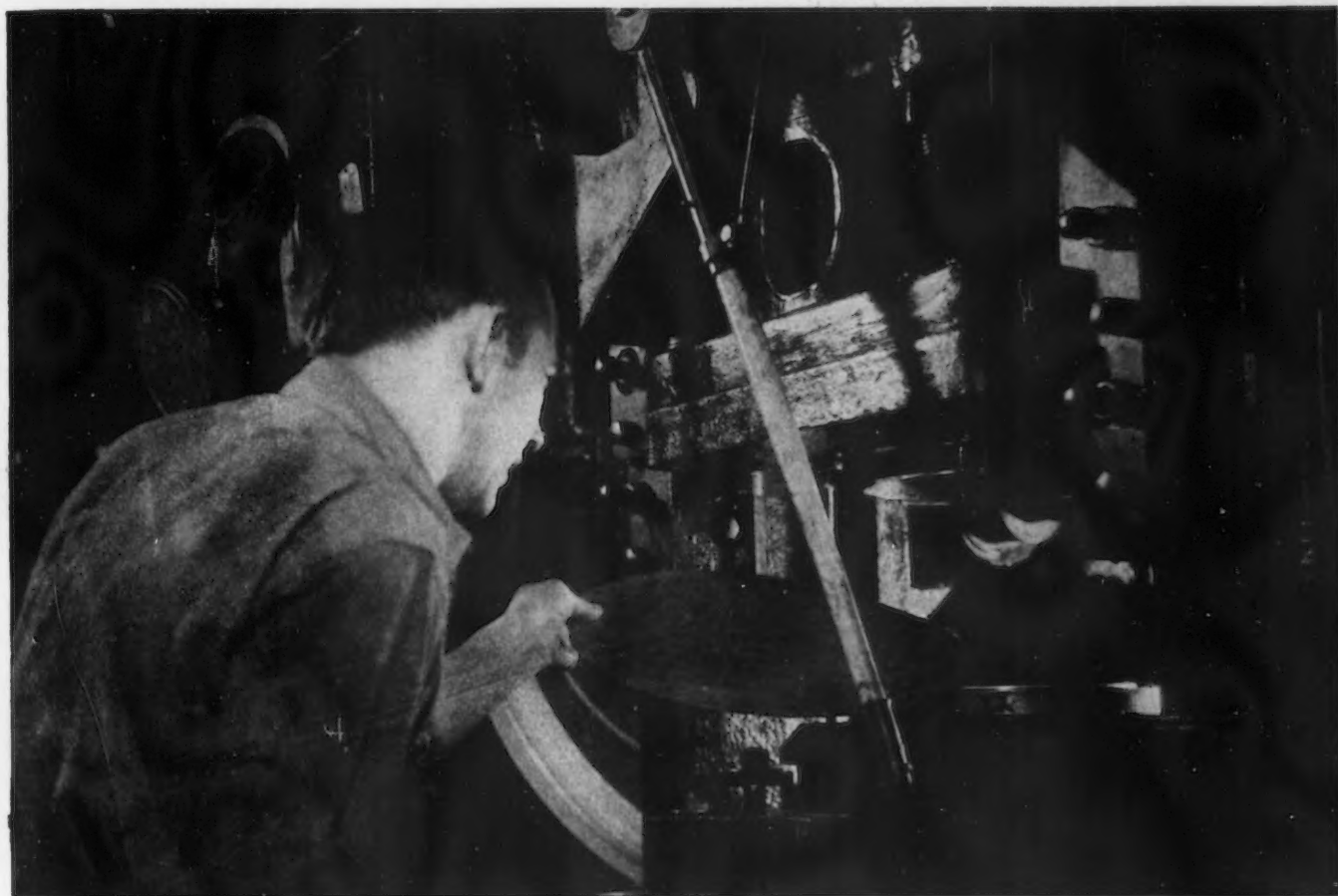
The South African Iron & Steel Works is planning to spend £1,500,000 on extensions, including a new fencing wire department.

## "The Story of Scrap" Published By Scrap Institute

THE Institute of Scrap Iron and Steel, 11 West 42d Street, New York, has prepared for free distribution a booklet entitled "The Story of Scrap." The booklet is written in non-technical language to give those not thoroughly familiar with the gathering, preparation and use of scrap a comprehensive view of this industry. It contains statistics on consumption, exports and prices over a period of years. Copies may be obtained from the institute.



# Here's a Fine *Profit-Opportunity* for Galvanized Sheet Fabricators . . .



Now you can use galvanized sheets in your products or equipment with complete assurance of getting a smooth, unbroken surface.

ARMCO ZINCGRIP, a revolutionary new kind of galvanized sheet, makes this possible. It means greater satisfaction for buyers, more profit for you.

Here is a ductile galvanized sheet with remarkable coating adherence. The zinc clings firmly to the base metal—even in severe forming and drawing operations. It's an attractive sheet, too, a metal that will do justice to your product design.

The tenacious coating adherence of ARMCO ZINCGRIP assures protection at all points. No longer will peeling or flaking along seams and edges detract from appearance and shorten service life.

Your customers will enthusiastically approve your

## ARMCO ZINCGRIP SHEETS



G I V E   F U L L   P R O T E C T I O N

use of ARMCO ZINCGRIP galvanized sheets. At the same time it will give you some convincing talking points for those hard-to-sell prospects.

You can buy ARMCO ZINCGRIP in either sheets or coils, with a choice of these three base metals: open-hearth steel, copper-bearing steel, or extra-durable ARMCO Ingot Iron. Just mail the handy coupon for full information. No obligation. The American Rolling Mill Co., 1250 Curtis Street, Middletown, Ohio.

### MAIL FOR ZINCGRIP FACTS

The American Rolling Mill Company  
1250 Curtis Street, Middletown, Ohio

Send me full information on ARMCO ZINCGRIP galvanized ☐ Sheets ☐ Coils

We are interested in ZINCGRIP for \_\_\_\_\_

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_



**SEND US YOUR  
BLUE-PRINTS . . .**

**PITTSBURGH TUBING** may help you make  
**Mechanical Parts CHEAPER and BETTER!**

Your engineers know what they want to accomplish. Our engineers know what can be done with mechanical tubing — they are specialists in the adaptation of this versatile material to a remarkable range of uses. Let them study your blue-prints and specifications. They may be able to show you new economies of machining time, tool wear, metal stock, and power consumption, in turning out the parts that you require. You will be under no obligation.



**P Pittsburgh**

**PITTSBURGH STEEL COMPANY • 1652 GRANT BLDG. • PITTSBURGH, PA.**  
NEW YORK    DETROIT    CHICAGO    CLEVELAND    TULSA  
HOUSTON    LOS ANGELES  
*Stocks carried by Distributors in Principal Cities*

**Seamless**  
**STEEL MECHANICAL  
TUBING**

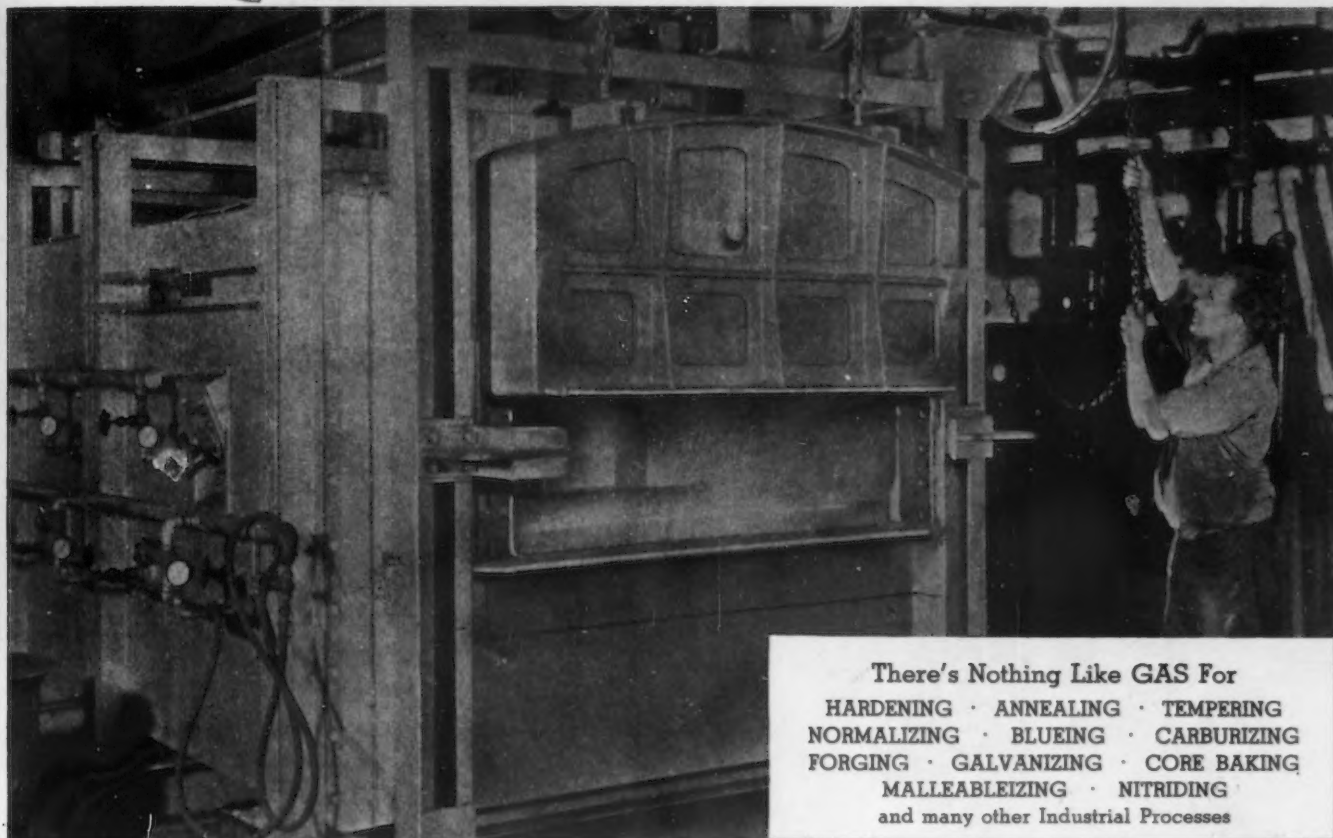
**THERE IS NOTHING EQUAL TO SEAMLESS**



# Gas

## ALSO TEMPER THE COST OF TREATED METALS

Modern, GAS-fired furnace de luxe in use  
at New York City plant of R. Hoe & Company.



There's Nothing Like GAS For  
HARDENING · ANNEALING · TEMPERING  
NORMALIZING · BLUEING · CARBURIZING  
FORGING · GALVANIZING · CORE BAKING  
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and many other Industrial Processes

High in heat value, and capable of precise control, GAS produces perfect furnace conditions that result in a better product at materially reduced cost.

With modern GAS equipment, the combustion mixture is regulated automatically to synchronize with load demands . . . the heat is evenly diffused to produce uniformly perfect results and reduce losses from spoilage . . . work is speeded and furnace maintenance is

brought to an absolute minimum.

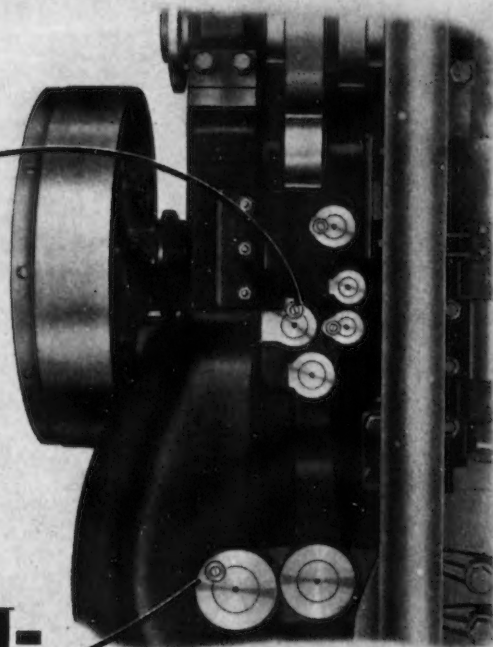
Shown here is a modern, multi-duty, GAS-fired furnace with automatic temperature control ranging from 900 to 1,800 degrees F. It is equipped for economical heat treating of ferrous and non-ferrous metals, and is ideal for exacting factory work.

Investigate how GAS can temper the cost of treating metals in your plant!

AMERICAN GAS ASSOCIATION  
INDUSTRIAL GAS SECTION  
420 LEXINGTON AVENUE, NEW YORK

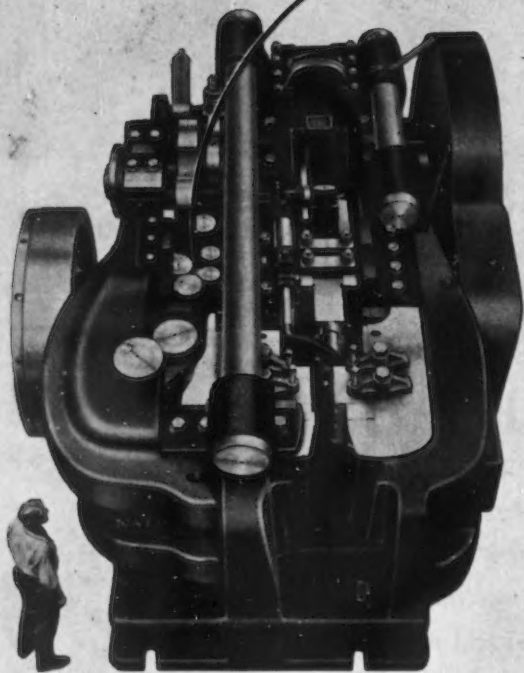


**SINCE  
1914**



## **The TANDEM- TOGGLE GRIP RELIEF**

***The Forging Machine "Safety"***



**T**O be effective, a Forging Machine grip relief must provide enormous power to the gripping dies, must be fool-proof, must protect the machine against accidental overloads, and must automatically reset.

Originated by National Engineers in 1914, the basic idea embodied in the Tandem-Toggle Grip Relief is so fundamentally sound that it has withstood all attempts to improve it.

# **NATIONAL**

**MACHINERY COMPANY**  
TIFFIN, OHIO.

New York

Detroit

Chicago



# 20 YEARS AGO, THEY COULDN'T DO IT...



*Today..* **STEEL CASTINGS**

## MAKE MILE LONG TRAINS POSSIBLE

### Steel Castings Bring You These Advantages

- 1 Uniform structure, for greater strength, shock and stress resistance.
- 2 Metal distributed where it will do the most good; maximum strength with minimum weight.
- 3 Widest range of physical properties.
- 4 Good machining qualities, low finishing costs, better streamlined appearance.
- 5 High rigidity, minimum deflection, accurate alignment, close tolerances and better fit.
- 6 Readily weldable in composite structures.
- 7 High fatigue resistance, maximum endurance and longer life — ideal for critically stressed parts.

The railroad industry is one of the largest users of steel castings. Today, about 35% of the weight of a locomotive, and 16% to 18% of the modern freight car, is of this practical and economical material.

Cast steel parts have made better equipment less costly, and they have cut operating costs by saving weight and contributing strength and safety. They make mile long trains, running at increased speeds, economically practical.

In other industries, too, the use of steel castings is growing, because they provide great strength and toughness — great ability to resist shocks, strains and vibration — and often a saving in weight.

Whatever you make, steel castings will help you build a better product. Frequently they cost less than parts of other materials — they permit better weight distribution — they reduce finishing cost.

Why not discuss this subject with your local foundry? Or, if you prefer, consult Steel Founders' Society, 920 Midland Bldg., Cleveland. There is no obligation.

**IMPROVE YOUR PRODUCT WITH**

# STEEL CASTINGS

# ANNOUNCING

## G-E GLYPTAL, No. 1294

Prevents Adhesion of Weld  
Spatter, Prevents Corrosion



Sample lap weld treated with Glyptal No. 1294 Gray before arc welding. Note the spatter-free surfaces adjacent to the weld. Overlapped edges are protected against corrosion.

Typical fillet weld on plates not protected by Glyptal No. 1294. Note the weld spatter that must be chipped off before finishing.



### APPLICATIONS

This new coating compound is now available in two varieties:

**Glyptal No. 1294 Clear**—Prevents adhesion of weld spatter and resists corrosion of steel in storage.

**Glyptal No. 1294 Gray**—Provides all the advantages of the clear variety. In addition, it prevents corrosion of surfaces inaccessible after welding, such as the overlapping edges of a lap joint. It can also be used with resistance welding.

### ADVANTAGES

The use of either variety saves practically all the time otherwise required for cleaning weld spatter from surfaces which are to be finished. A single coating serves for both singlepass and multipass welds. It need not be removed after welding—in fact, it serves as an excellent base or primer for paint. Either variety can be sprayed or brushed—coverage per gallon is approximately 500 square feet for the clear and 400 square feet for the gray. Neither causes injurious fumes or smoke to form on the welder's glass. Neither causes porosity or carbon to injure the ductility of the weld.

Try some of this material today. See what a big saving it makes in your fabrication costs. Call the nearest G-E arc-welding distributor or G-E sales office, or write General Electric, Schenectady, N. Y.

**GENERAL ELECTRIC**

# JUST BETWEEN US TWO

## 32-Day Scoop

Taking a picture of an industry in motion is like trying to catch Sam Snead at the moment he begins to get his wrists into his downswing. But if we do say it ourselves, your favorite family journal makes a highly successful attempt in its Summary of the Week (page 68).

The mash for this pours in by telegram and teletype from the field editors and correspondents every Tuesday afternoon. Almost immediately Steve Wright, your favorite family journal's managing editor, distills it into a page summary, during which process he is as unapproachable as a crack miler in the stretch.

A linotype is kept waiting; the presses run all night, and the Summary—in *THE IRON AGE*—is in the mails on the way to you Wednesday morning. The news services wire it to their members in time to make the Wednesday noon editions.

Like a steak dinner, its handling is timed to the point of feverishness. But we know one newspaper that doesn't take all the rush seriously—the *Manila, P.I., Bulletin*. Its May 21 issue carries the summary of Apr. 19. Probably got it by whaling vessel.

## Blue Notes Offend Purist's Ear

A visitor last week was Fred W. (Westinghouse Air Brake) Pennington, who wrapped our knuckles for using the italicized words incorrectly in the sentence, "They (the trade paper brass hats) want a new measuring stick of reader interest—something with glamor, *flair*—something *exotic*."

Exotic means *foreign, alien, remote*, which is vaguely what we meant. But *flair*, to our horror, has to do with *sense of smell*. We can't imagine how that got in, and all we can say is that we are sorry.

## Ex-Navyman Sees Red

"The automotive industry degrades a graphic and appealing nautical word when it speaks of 'tumble-in.' It should be," writes A. W. Miller, "'tumble-home,' meaning the inward curve or line from a convexity."

Of course, our public is right. "Tumble-home" is far more expressive, and we hope Bill Sherman, our Detroit editor, will speak to Fisher, Briggs and the other body people about it. Mr. Miller adds:

"I am slowly collecting my vocabulary of words adapted from English into the shop, with modifications of their meaning which make them more graphic and compelling to the eye. I note offhand: die-sinking, tramp iron, fugitive colors, baffling air flow, foul hammer blow, hunting gear tooth, strawberry fit, metal fatigue, wring fit, forging flash—and, from your June 15 issue, barbering a die."

"I propose, too," he continues, "to collect oddities like *sull*, *bosh*, and *therblig*. Your help will be appreciated." All we can think of at the moment is something that puzzles us on page 49 of the June 15 issue—*high titer fats*, which sounds like a phrase from the chorus of "Hold Tight."

## Typographical Sabotage

Our metallurgical editor, Tom Lippert, who has to keep in touch with such things, tells us that the instruction plate on Pittsburgh's nickel-in-the-slot parking meters spells it "nickle."

## Puzzles

Charley (Hoskins Mfg.) Kinnison acknowledges handsomely Loring C. Farwell's correction of his answer to the May 18 fence problem:

Yes, I was wrong—I'll tell you why—  
I don't know how to multiply.  
When I squared 6-3-3-6-0,  
I missed it by a mile or so.  
Yes, when I'm wrong—by gum—I'm wrong!  
My error was nine digits long!

It's plain I need a mental crutch,  
So, Mr. Farwell, thank you much!

The barrel unsold in last week's problem was the 20-gal. one. Farmer A took the 15 and 18 gal. barrels, and Farmer B doubled him with the 16, 19 and 31-gal.

This headache is from Thomas Abraham of New Kensington, Pa.: A monkey is perched on a tree "h" feet high, and a hunter, lying on the ground "d" feet away (horizontal distance), is aiming his gun directly at the monkey at an angle. Neglecting air resistance and assuming that the monkey is within range, prove that the monkey will or will not be hit if he drops from his perch the instant the gun is fired.

—A.H.D.



# PRODUCTS INDEX

## WHO MAKES IT

Here you find a weekly listing of hundreds of products with the names and addresses of manufacturers. The advertisements of these companies appear in The Iron Age.

### ABRASIVE CLOTH & PAPER

Norton Co., Worcester, Mass.

### ABRASIVE WHEELS—See Grinding Wheels

**ABRASIVES—Steel Shot and Grit**  
Harrison Abrasive Corp., Manchester, N. H.  
Pangborn Corporation, Hagerstown, Md.  
Pittsburgh (Pa.) Crushed Steel Co.  
Steel Shot & Grit Co., Boston, Mass.

### ACCESSORIES—Welding

Lincoln Electric Co., The, Cleveland.

### ACCUMULATORS—Hydraulic

Baldwin-Southwark Corp., Southwark Div., Philadelphia.  
Lako Erie Engineering Corp., 68 Kenmore St., Buffalo, N. Y.  
Watson-Stillman Co., The, 103 Aldene Road, Roselle, N. J.  
Wood, R. D., & Co., Philadelphia.

### ACETYLENE—Dissolved in Cylinders & Small Tanks

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.  
Linde Air Products Company, The, 30 West 42nd St., N. Y. C.

### ACIDS—Pickling

American Chemical Paint Co., Ambler, Pa.

### ALLOYS—Copper

American Brass Co., The, Waterbury, Conn.  
Mallory, P. R., & Co., Inc., Indianapolis, Ind.

### ALLOYS—Ferro

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

### ALLOYS—Magnesium

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

### ALLOYS—Tungsten

Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

### ALLOYS—Vanadium

Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

### ALLOYS—Zinc Base Die Casting

New Jersey Zinc Co., The, 160 Front St., N. Y. C.

### ALUMINUM

Aluminum Co. of America, Pittsburgh.

### AMMETERS & VOLTMETERS

General Electric Co., Schenectady, N. Y.  
Weston Electrical Instrument Corp., New ark, N. J.

### AMMETERS AND VOLTMETERS—Recording

Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

### AMMONIA RECOVERY PLANTS

Koppers Co., Engineering & Construction Div., Pittsburgh.

### ANGLES, BEAMS, CHANNELS AND TEES

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.  
Inland Steel Co., Chicago.  
Jones & Laughlin Steel Corp., Pittsburgh.  
Ryerson, Jos. T., & Son, Inc., Chicago.  
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.  
Steel & Tubes, Inc., Cleveland.  
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

### ANGLES, BEAMS, CHANNELS & TEES—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

### ANNEALING—See Heat Treating

### ANNEALING BOXES

Pittsburgh (Pa.) Annealing Box Co.  
United Engineering & Fdry. Co., Pgh.

### ANNEALING COVERS

Pittsburgh (Pa.) Annealing Box Co.

### ANODES—Lead

National Lead Co., 111 Bdway., N. Y. C.

### APPAREL—Welding

Lincoln Electric Co., The, Cleveland.

### ARBORS

Cincinnati (Ohio) Milling Mch. Co., The.  
Morse Twist Drill & Mch. Co., New Bedford, Mass.

### ARMORING MACHINERY—Cable, Wire, Hose

Sleeper & Hartley, Inc., Worcester, Mass.

### ARRESTERS—Spark

Harrington & King Perforating Co., Chicago.

### ASBESTOS

Carey, Philip, Co., The, Cincinnati, Ohio.  
Johns-Manville Corp., 22 East 40th St., N. Y. C.

### AXLES—Car or Locomotive

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

### BABBITT METALS

Bunting Brass & Bronze Co., The, Toledo, Ohio.  
Cadman, A. W., Mfg. Co., Pittsburgh.  
Cramp Brass & Iron Foundries Co., Philadelphia.

### BALANCING EQUIPMENT

Sundstrand Machine Tool Co., Rockford, Ill.

### BALANCING MACHINES—Static Dynamic

Gisholt Machine Co., Madison, Wis.

### BALING PRESSES—Scrap—See Presses—Baling

### BALLS—Burnishing

Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.  
Hartford (Conn.) Steel Ball Co., The.

### BALLS—Steel, Brass or Bronze

Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.  
Hartford (Conn.) Steel Ball Co., The.  
New Departure Div., General Motors Corp., Bristol, Conn.

### BARDS—Steel

Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

### BARRELS—Burnishing

Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.

### BARRELS—Tumbling

Baird Mch. Co., The, Bridgeport, Conn.  
Hartford (Conn.) Steel Ball Co., The.  
Whitling Corp., Harvey, Ill.

### BARNS—Alloy

Midvale Co., The, Nicetown, Phila., Pa.  
Republic Steel Corp., Cleveland, Ohio.

### BARNS—Aluminum

Aluminum Co. of America, Pittsburgh.

### BARNS—Brass, Bronze or Copper

Bunting Brass & Bronze Co., Toledo, Ohio.  
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

### BARNS—Cold Drawn

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.  
Bliss & Laughlin, Inc., Harvey, Ill.;  
Buffalo, N. Y.

### BARNS—Jones & Laughlin Steel Corp., Pittsburgh

Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

### BARNS—Concrete Reinforcing

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.  
Jones & Laughlin Steel Corp., Pittsburgh.  
Laclede Steel Co., St. Louis, Mo.  
Nicolet Plate Washer Co., Inc., Philadelphia.

### BARNS—Tennessee Coal, Iron & Railroad Co.

(U. S. Steel Corp. Subsidiary), Birmingham, Ala.

### BARNS—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

### BARNS—Rustless

Midvale Co., The, Nicetown, Phila., Pa.  
Rustless Iron & Steel Corp., Baltimore, Md.

### BARNS—Steel

Behlheim (Pa.) Steel Company.  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

### BEARINGS—Rolling Mill Equipment

Bantam Bearings Corp., The, South Bend, Ind.

### BEARINGS—Rolling Mill Equipment

Morgan Construction Co., Worcester, Mass.  
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.  
Timken Roller Bearing Co., The, Canton, O.

### BEARINGS—Shaft Hanger

Hyatt Bearings Div. General Motors Corp., Newark, N. J.  
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

### BEARINGS—Thrust

Bantam Bearings Corp., The, South Bend, Ind.

Bearings Co. of America, Lancaster, Pa.  
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.  
Hyatt Bearings Div. General Motors Corp., Bristol, Conn.  
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.  
Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
Timken Roller Bearing Co., The, Canton, O.

### BELT—Conveyor, Elevator

Goodrich, B. F., Co., The, Akron, Ohio.  
Hewitt Rubber Corp., Buffalo, N. Y.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

### BELTING—Leather

Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

### BELTING—Metal, Conveyor, High and Low Temperature

Wickwire Spencer Steel Co., 500 Fifth Ave., N. Y. C.

### BELTING—Rubber

Goodrich, B. F., Co., The, Akron, Ohio.  
Hewitt Rubber Corp., Buffalo, N. Y.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

### BELTS—V-Type

Ills-Chalmers Mfg. Co., Milwaukee.  
Goodrich, B. F., Co., The, Akron, Ohio.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

### BENCH LEGS—Steel

New Britain-Gridley Machine Div., The, New Britain Machine Co., New Britain, Conn.

### BENDING MACHINES—Hand, Band and Angle

Excelsior Tool & Mch. Co., E. St. Louis, Ill.

### BENDING MACHINES—Hand and Power

Buffalo (N. Y.) Forge Co., 492 Broadway.  
Cincinnati (Ohio) Shaper Co., The.  
Cleveland (Ohio) Punch & Shear Works Co., The.  
Niagara Machine & Tool Works, Buffalo, N. Y.

### BENZOL RECOVERY PLANTS

Koppers Co., Engineering & Construction Div., Pittsburgh.

### BERYLLIUM COPPER

American Brass Co., The, Waterbury, Conn.

### BEZELS & ESCUTCHEONS

Grammes, L. F., & Sons, Inc., Allentown, Pa.

### BILLETS—Alloy

Harrisburg (Pa.) Steel Corp.  
Midvale Co., The, Nicetown, Phila., Pa.

### BILLETS—Alloy Steel

Andrews Steel Co., The, Newport, Ky.

### BILLETS—Carbon

Harrisburg (Pa.) Steel Corp.

### BILLETS—Carbon Steel

Andrews Steel Co., The, Newport, Ky.

### BILLETS—Chrome Nickel Steel

Rustless Iron & Steel Corp., Baltimore, Md.

### BILLETS—Chrome Steel

Rustless Iron & Steel Corp., Baltimore, Md.

### BILLETS—Forging

Alan Wood Steel Co., Conshohocken, Pa.  
Andrews Steel Co., The, Newport, Ky.  
Harrisburg (Pa.) Steel Corp.  
Republic Steel Corp., Cleveland, Ohio.

### BEARINGS—Rolling Mill Equipment

Bantam Bearings Corp., The, South Bend, Ind.

Morgan Construction Co., Worcester, Mass.  
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.  
Timken Roller Bearing Co., The, Canton, O.

### BEARINGS—Shaft Hanger

Hyatt Bearings Div. General Motors Corp., Newark, N. J.  
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

### BEARINGS—Thrust

Bantam Bearings Corp., The, South Bend, Ind.

Bearings Co. of America, Lancaster, Pa.  
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.  
Hyatt Bearings Div. General Motors Corp., Bristol, Conn.  
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.  
Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
Timken Roller Bearing Co., The, Canton, O.

### BELT—Conveyor, Elevator

Goodrich, B. F., Co., The, Akron, Ohio.  
Hewitt Rubber Corp., Buffalo, N. Y.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

### BELTING—Leather

Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

### BELTING—Metal, Conveyor, High and Low Temperature

Wickwire Spencer Steel Co., 500 Fifth Ave., N. Y. C.

### BELTING—Rubber

Goodrich, B. F., Co., The, Akron, Ohio.  
Hewitt Rubber Corp., Buffalo, N. Y.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

### BELTS—V-Type

Ills-Chalmers Mfg. Co., Milwaukee.  
Goodrich, B. F., Co., The, Akron, Ohio.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

### BENCH LEGS—Steel

New Britain-Gridley Machine Div., The, New Britain Machine Co., New Britain, Conn.

### BENDING MACHINES—Hand, Band and Angle

Excelsior Tool & Mch. Co., E. St. Louis, Ill.

### BENDING MACHINES—Hand and Power

Buffalo (N. Y.) Forge Co., 492 Broadway.  
Cincinnati (Ohio) Shaper Co., The.  
Cleveland (Ohio) Punch & Shear Works Co., The.  
Niagara Machine & Tool Works, Buffalo, N. Y.

### BENZOL RECOVERY PLANTS

Koppers Co., Engineering & Construction Div., Pittsburgh.

### BERYLLIUM COPPER

American Brass Co., The, Waterbury, Conn.

### BEZELS & ESCUTCHEONS

Grammes, L. F., & Sons, Inc., Allentown, Pa.

### BILLETS—Alloy

Harrisburg (Pa.) Steel Corp.  
Midvale Co., The, Nicetown, Phila., Pa.

### BILLETS—Alloy Steel

Andrews Steel Co., The, Newport, Ky.

### BILLETS—Carbon

Harrisburg (Pa.) Steel Corp.

### BILLETS—Carbon Steel

Andrews Steel Co., The, Newport, Ky.

### BILLETS—Chrome Nickel Steel

Rustless Iron & Steel Corp., Baltimore, Md.

### BILLETS—Chrome Steel

Rustless Iron & Steel Corp., Baltimore, Md.

### BILLETS—Forging

Alan Wood Steel Co., Conshohocken, Pa.  
Andrews Steel Co., The, Newport, Ky.  
Harrisburg (Pa.) Steel Corp.  
Republic Steel Corp., Cleveland, Ohio.

# PRODUCTS INDEX

## BILLETS—Re-rolling

Alan Wood Steel Co., Conshohocken, Pa.  
Andrews Steel Co., The, Newport, Ky.

## BILLETS—Steel

Bethlehem (Pa.) Steel Company.  
Continental Steel Corp., Kokomo, Ind.  
Harrisburg (Pa.) Steel Corp.  
Jones & Laughlin Steel Corp., Pittsburgh.  
Tennessee Coal, Iron & Railroad Co.  
(U. S. Steel Corp. Subsidiary), Birmingham, Ala.

## BLANKS—Chisel

Cleveland (Ohio) Punch & Shear Works Co., The.  
Cleveland Steel Tool Co., The, 660 E. 82nd St., Cleveland, Ohio.

## BLANKS—Gear and Pinion

Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

## BLANKS—Gear, Silent Steel

Waldron, John, Corp., New Brunswick, N. J.

## BLAST CLEANING EQUIPMENT

American Foundry Equipment Co., The, 510 S. Byrkit St., Mishawaka, Ind.  
Pangborn Corporation, Hagerstown, Md.

## BLAST FURNACES

Brasseri, H. A. & Co., Chicago, Ill.

## BLAST GATES

Rockwell, W. S. Co., 50 Church St., N.Y.C.  
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

## BLOWERS

Buffalo (N. Y.) Forge Co., 492 Broadway.

## BLOWPIPES—Oxy-Acetylene Welding & Cutting

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

## BOILERS—Waste Heat

Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.

## BOILERS—Water Tube

Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.

## BOLT CUTTERS

Landis Mch. Co., Inc., Waynesboro, Pa.  
National Machinery Co., Tiffin, Ohio.

## BOLT AND NUT MACHINERY

Acme Machinery Co., The, Cleveland.  
Ajax Mfg. Co., The, Cleveland, Ohio.  
Landis Machine Co., Inc., Waynesboro, Pa.  
National Machinery Co., Tiffin, Ohio.  
Waterbury (Ct.) Farrel Fdry. & Mch Co., The.

## BOLT POINTING MACHINES

Acme Machinery Co., The, Cleveland.

## BOLT & RIVET CLIPPERS

Heinig Mfg. Co., St. Paul, Minn.

## BOLTS—Carriage and Machine

Cleveland (Ohio) Cap Screw Co., The.  
Lamon & Sessions Co., The, Cleveland.  
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

## BOLTS—Special

Lamon & Sessions Co., The, Cleveland.  
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

## BOLTS—Special, Hot or Cold Upset

Lamon & Sessions Co., The, Cleveland.

## BOLTS—Stove

Lamon & Sessions Co., The, Cleveland.  
Progressive Mfg. Co., Torrington, Conn.

## BOLTS—Stove, Recessed Head

American Screw Co., Providence, R. I.

## BOLTS—Track

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

## BOLTS AND NUTS

American Screw Co., Providence, R. I.  
Clark Bros. Bolt Co., Milldale, Conn.  
Lamon & Sessions Co., The, Cleveland.  
Remble Steel Corp., Cleveland, Ohio.  
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.  
Triplex Screw Co., Cleveland.

## BOLTS AND NUTS—Self Locking

Lamon & Sessions Co., The, Cleveland.

## BOND—Grinding Wheel

Bakelite Corp., 247 Park Ave., New York City.

## BORING BARS

Bullard Co., The, Bridgeport, Conn.

## BORING, DRILLING & MILLING MACHINES—Horizontal

Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.  
Lucas Machine Tool Co., Cleveland.  
National Automatic Tool Co., Richmond, Ind.

## BORING & DRILLING MACHINES—Vertical

Baker Bros., Inc., Toledo, Ohio.  
Bullard Co., The, Bridgeport, Conn.

## BORING MACHINES—Diamond & Carbide Tools

Heald Machine Co., Worcester, Mass.  
Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

## BORING MACHINES—Precision

Cimatool Co., The, Dayton, Ohio.

## BORING & TURNING MILLS—Vertical

Bullard Co., The, Bridgeport, Conn.  
Cincinnati (Ohio) Planer Co.

## BRAKE LINING AND BLOCKS—Asbestos

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

## BRACKS—Electric

Clark Controller Co., The, Cleveland.  
Cutler-Hammer, Inc., Milwaukee.  
Electric Controller & Mfg. Co., The, Cleveland.

Kiekhaefer Corp., Cedarburg, Wisc.

## BRACKS—Electric & Mechanical

Clark Controller Co., The, Cleveland.  
Electric Controller & Mfg. Co., The, Cleveland.

## BRACKS—Magnetic

Kiekhaefer Corp., Cedarburg, Wisc.  
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

## BRACKS—Metal Forming

Brant Machinery & Engineering Co., Chicago.

Cincinnati (Ohio) Shaper Co., The.

Cleveland Crane & Engineering Co., The.

Steelweld Machinery Div., Wickliffe, Ohio.

Dreis & Krump Mfg. Co., Chicago.

Ferracute Machine Co., Bridgeton, N. J.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

## BRICK—Fire Clay

Carborundum Co., The, Niagara Falls, N. Y.

Illinois Clay Products Co., Joliet, Ill.

## BRICK—Insulating

Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.

## BRIDGE BUILDERS

American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Belmont Iron Works, Philadelphia.

## BRIDGE OPERATING MACHINERY—Movable

Earle Gear & Mch. Co., Philadelphia.

## BRICKETS—Ferrosil

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

## BROACHES

Colonial Broach Co., Detroit.

## BROACHING MACHINES

Bullard Co., The, Bridgeport, Conn.

Cincinnati (Ohio) Milling Mch. Co., The.

Colonial Broach Co., Detroit.

Lucas Machine Tool Co., Cleveland.

Oilge Co., The, 1311 W. Bruce St., Milwaukee.

## BRONZE FOR DIES

Ameco Metal, Inc., Milwaukee, Wisc.

## BRONZE—Phosphor

Bunting Brass & Bronze Co., Toledo, Ohio.

## BRUSHES—Machine

Pittsburgh Plate Glass Co., Brush Div., Baltimore, Md.

## BRUSHES—Wire

Pittsburgh Plate Glass Co., Brush Div., Baltimore, Md.

## BUCKETS—Clamshell

Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh, Pa.

Cullen-Friedstedt Co., 1303 S. Kilbourn Ave., Chicago.

Hayward Co., The, 50 Church St., N. Y. C.

Heyl & Patterson, Inc., Pittsburgh.

Industrial Brownhoist Corp., Bay City, Mich.

Wellman Engineering Co., The, Cleveland.

## BUCKETS—Electric Motor

Hayward Co., The, 50 Church St., N. Y. C.

## BUCKETS—Orange Peel

Hayward Co., The, 50 Church St., N. Y. C.

## BUFFERS & POLISHING MACHINES

Packer Machine Co., The, Meriden, Conn.

## BUFFING APPLICATORS—Automatic

Packer Machine Co., The, Meriden, Conn.

## BUFFING COMPOUND

Harrison & Co., Haverhill, Mass.

## BUILDINGS—Steel

American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

American Rolling Mill Co., Middletown, Ohio.

Belmont Iron Works, Philadelphia.

Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh, Pa.

Iron & Steel Products, Inc., Chicago.

## BULLDOZERS

Ajax Mfg. Co., The, Cleveland, Ohio.

Cleveland Crane & Engineering Co., The.

Steelweld Machinery Div., Wickliffe, Ohio.

## BURNISHING MACHINES—Gear

Cimatool Co., The, Dayton, Ohio.

## BURNING MACHINES

Acme Machinery Co., The, Cleveland.

## CIMATOL CO., The, Dayton, Ohio.

## BUSHINGS—Bronze

Ameco Metal, Inc., Milwaukee, Wisc.

Bunting Brass & Bronze Co., Toledo, O.

Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

Shenango-Penn Mold Co., Dover, Ohio.

## BUSHINGS—Oilless

Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

## BUSHINGS—Phosphor Bronze

Bunting Brass & Bronze Co., Toledo, Ohio.

## BY-PRODUCTS COKE AND GAS

PLANTS

Koppers Co., Engineering & Construction Div., Pittsburgh.

CABINETS—Tool and Parts

Standard Steel Products Co., Poughkeepsie, N. Y.

## CABLE—Electric

General Electric Co., Schenectady, N. Y.

Lincoln Electric Co., The, Cleveland.

## CABLEWAYS AND TRAMWAYS—See Tramways

## CALCIUM METAL & ALLOYS

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

## CARBIC

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

## CARBIDE

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

## CARBIDE—Boron

Norton Co., Worcester, Mass.

## CARBURIZING—See Heat Treating

## CARLOADERS

Clark Tractor Div., Clark Equipment Co., Battle Creek, Mich.

## CARS—Railway

Iron & Steel Products, Inc., Chicago.

## CARS—Industrial and Mining

Atlas Car & Mfg. Co., The, Cleveland.

Heyl & Patterson, Inc., Pittsburgh.

## CASE HARDENING—See Heat Treating

## CASTERS

Darnell Corp., Ltd., Long Beach, Calif.

## CASTINGS—Acid or Heat Resisting

Ameco Metal, Inc., Milwaukee, Wisc.

Cramp Brass & Iron Foundries Co., Philadelphia.

Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

Hoskins Mfg. Co., Detroit, Mich.

Michiana Products Corp., Michigan City, Ind.

Ohio Steel Foundry Co., Lima, Ohio.

## CASTINGS—Alloy Iron

Cramp Brass & Iron Foundries Co., Philadelphia.

Michiana Products Corp., Michigan City, Ind.

CASTINGS—Alloy Steel

Advance Foundry Co., The, Dayton, Ohio.

Hartford (Conn.) Electric Steel Corp.

Mackintosh-Hemphill Co., Pittsburgh.

Michiana Products Corp., Michigan City, Ind.

National-Erie Corp., Erie, Pa.

## CASTINGS—Aluminum

Aluminum Co. of America, Pittsburgh.

## CASTINGS—Brass, Bronze, Copper or Aluminum

Bunting Brass & Bronze Co., The, Toledo, Ohio.

Cadman, A. W., Mfg. Co., Pittsburgh.

Carbon Malleable Casting Co., Inc., Lancaster, Pa.

Cramp Brass & Iron Foundries Co., Philadelphia.

National Bearing Metals Corp., Pittsburgh.

Shenango-Penn Mold Co., Dover, Ohio.

Spencer's, I. S. Sons, Inc., Guilford, Ct.

## CASTINGS—Bronze

Koppers Co., Bartlett Hayward Div., Baltimore, Md.

## CASTINGS—Corrosion Resisting

Cramp Brass & Iron Foundries Co., Philadelphia.

Michiana Products Corp., Michigan City, Ind.

Midvale Co., The, Nicetown, Phila., Pa.

Ohio Steel Foundry Co., Lima, Ohio.

## CASTINGS—Die

Titan Metal Mfg. Co., Bellefonte, Pa.

## CASTINGS—Die, Aluminum

Aluminum Co. of America, Pittsburgh.

## CASTINGS—Electric Steel

Continental Roll & Steel Foundry Co., East Chicago, Ind.

Crucible Steel Castings Co., Lansdowne, Pa.

National-Erie Corp., Erie, Pa.

Ohio Steel Foundry Co., Lima, Ohio.

## CASTINGS—Gray Iron

Advance Foundry Co., The, Dayton, Ohio.

American Engineering Co., Philadelphia.

Cramp Brass & Iron Foundries Co., Philadelphia.

Dodge Mfg. Corp., Mishawaka, Ind.

Koppers Co., Bartlett Hayward Div., Baltimore, Md.

National Roll & Fdry. Co., Avonmore, Pa.

North Wales (Pa.) Mach. Co., Inc.

Spencer's, I. S. Sons, Inc., Guilford, Ct.

CASTINGS—High Test & Alloy Iron

Cramp Brass & Iron Foundries Co., Philadelphia.

Lakeside Ave., Cleveland.

Peoria (Ill.) Malleable Castings Co.

CASTINGS—Manganese, Steel and Alloy

Pettibone Mulliken Corp., Chicago.

CASTINGS—Monel & Nickel

Cramp Brass & Iron Foundries Co., Philadelphia.

CASTINGS—Semi-Steel

Cramp Brass & Iron Foundries Co., Philadelphia.

## CASTINGS—Steel

American Rolling Mill Co., Middletown, Ohio.

Rethlehem (Pa.) Steel Company.

Bridgeboro (Pa.) Steel Foundry & Machine Co.

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.



# PRODUCTS INDEX

**COAL**  
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

Koppers Coal Co., The, Pittsburgh.  
Soyuzugleport, Kallaevskaja Ulitsa 5, Moscow 6, U. S. S. R.

**COAL ORE & ASH HANDLING MACHINERY**  
Heyl & Patterson, Inc., Pittsburgh.  
Link-Belt Co., 300 West Pershing Road, Chicago, Ill.

**COBALT METAL**  
Central Trading Corp., 511 Fifth Ave., N. Y. C.

**COILS—Lead**  
National Lead Co., 111 Bdw., N. Y. C.

**COILS—Pipe**  
Harrisburg (Pa.) Steel Corp.

**COKE—Metallurgical**  
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

**COKE OVEN MACHINERY**  
Atlas Car & Mfg. Co., The, Cleveland.  
Koppers Co., Engineering & Construction Div., Pittsburgh.

**COLD ROLL FORMING MACHINES**  
McKay Machine Co., The, Youngstown, Ohio.

**COLUMBIUM**  
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

**COMBUSTION CONTROLS**  
Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

**COMPOUNDS—Drawing**  
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Penola, Inc., Pittsburgh.  
Standard Oil Co. (Indiana), Chicago.  
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

**COMPRESSORS—Air**  
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.

Westinghouse Air Brake Co., Industrial Div., Pittsburgh.  
Worthington Pump & Machinery Corp., Harrison, N. J.

**COMPRESSORS—Gas**  
Worthington Pump & Machinery Corp., Harrison, N. J.

**COMPRESSORS—Rebuilt.** (See Clearing House Section)

**CONDENSERS—Surface & Jet**  
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Worthington Pump & Machinery Corp., Harrison, N. J.

**CONDUITS—Flexible Metallic**  
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

**CONTACTS—Electrical**  
Mallory, P. R. & Co., Inc., Indianapolis, Ind.

**CONTRACTORS' SUPPLIES — Second-Hand.** (See Clearing House Section)

**CONTROL SYSTEMS—Temperature**  
Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

**CONTROLLERS—Crane**  
Clark Controller Co., The, Cleveland.  
Cutler-Hammer, Inc., Milwaukee.

Electric Controller & Mfg. Co., The, Cleveland.

**CONTROLLERS—Electric**  
Clark Controller Co., The, Cleveland.  
Cutler-Hammer, Inc., Milwaukee.

Electric Controller & Mfg. Co., The, Cleveland.

**CONTROLLERS—Valve, Electrically Operated**  
Cutler-Hammer, Inc., Milwaukee.

Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

**CONTROLS—Time Cycle**  
Koppers Co., Bartlett Hayward Div., Baltimore, Md.

**CONVEYING AND ELEVATING MACHINERY**  
Farquhar, A. B. Co., Ltd., York, Pa.

Heyl & Patterson, Inc., Pittsburgh.  
Link-Belt Co., 300 West Pershing Road, Chicago, Ill.

**CONVEYOR WORMS**  
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

**CONVEYORS—Monorail**  
American Monorail Co., The, Cleveland.

Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

**CONVEYORS—Portable**  
Farquhar, A. B. Co., Ltd., York, Pa.

**COPING MACHINES**  
Cleveland (Ohio) Punch & Shear Works Co., The.

Schats Mfg. Co., The, Poughkeepsie, N. Y.

**CORE OIL**  
Penola, Inc., Pittsburgh.

Sun Oil Co., Philadelphia.  
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

**CORUNDUM WHEELS—See Grinding Wheels**

**COTTERS AND KEYS—Spring**  
Hindley Mfg. Co., Valley Falls, B. I.

Hubbard, M. D., Spring Co., 745 Central Ave., Pontiac, Mich.

Lamson & Sessions Co., The, Cleveland.  
Western Wire Prods. Co., St. Louis, Mo.

**COUNTERBORES**  
Cleveland (Ohio) Twist Drill Co., The.  
Gairing Tool Co., Detroit.

Morse Twist Drill & Mch. Co., New Bedford, Mass.

**COUNTERS—Production**  
Durant Mfg. Co., Milwaukee.

Veeder-Root, Inc., Hartford, Ct.

**COUNTERS—Revolution, Recording**  
Durant Mfg. Co., Milwaukee.

**COUNTING MACHINES**  
Durant Mfg. Co., Milwaukee.

Veeder-Root, Inc., Hartford, Conn.

**COUPLINGS—Cut-off Friction**  
Foot Bros. Gear & Machine Co., 5301 H. So. Western Blvd., Chicago, Ill.

**COUPLINGS—Flexible**  
Crocker-Wheeler Electric Mfg. Co., Amere, N. J.

Koppers Co., Bartlett Hayward Div., Baltimore, Md.

Poole Foundry & Mch. Co., Baltimore, Md.

Waldron, John, Corp., New Brunswick, N. J.

**COUPLINGS—Pipe**  
Harrisburg (Pa.) Steel Corp.

National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

**CRANES—Crawling Tractor**  
American Hoist & Derrick Co., St. Paul, Minn.

Cullen-Friedstedt Co., 1303 S. Kilbourn Ave., Chicago.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Industrial Brownhoist Corp., Bay City, Mich.

Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

**CRANES—Electric, Industrial, Truck Mounted**  
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

Elwell-Parker Electric Co., The, Cleveland.

**CRANES—Electric Traveling**  
Arnel, James F., Pittsburgh.

Conco Engineering Works, Mendota, Ill.

Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.

Euclid Crane & Hoist Co., The, Euclid, O.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.

Morgan Engineering Co., The, Alliance, O.

Northern Engineering Works, Detroit, Mich.

Robbins & Myers, Inc., Springfield, Ohio.

Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

Whiting Corp., Harvey, Ill.

**CRANES—Gantry**  
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Morgan Engineering Co., The, Alliance, O.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

Whiting Corp., Harvey, Ill.

**CRANES—Hand Power**  
American Monorail Co., The, Cleveland.

Conco Engineering Works, Mendota, Ill.

Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.

Euclid Crane & Hoist Co., The, Euclid, O.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Industrial Brownhoist Corp., Bay City, Mich.

Northern Engineering Works, Detroit, Mich.

Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

Whiting Corp., Harvey, Ill.

**CRANES—Jib**  
American Monorail Co., The, Cleveland.

Euclid Crane & Hoist Co., The, Euclid, O.

Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

Whiting Corp., Harvey, Ill.

**CRANES—Locomotive**  
American Hoist & Derrick Co., St. Paul, Minn.

Cullen-Friedstedt Co., 1303 S. Kilbourn Ave., Chicago.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Industrial Brownhoist Corp., Bay City, Mich.

Link-Belt Co., 300 West Pershing Road, Chicago, Ill.

Ohio Locomotive Crane Co., The, Bucyrus, O.

**CRANES—Monorail**  
American Monorail Co., The, Cleveland.

Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

Euclid Crane & Hoist Co., The, Euclid, O.

Northern Engineering Works, Detroit, Mich.

Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

Whiting Corp., Harvey, Ill.

**CRANES—Portable**  
Canton Foundry & Mch. Co., Cleveland.

**CRANES—Portable Electric**  
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

Elwell-Parker Electric Co., The, Cleveland.

**CRANKSHAFTS**  
Tranau & Williams Steel Forging Corp., Alliance, Ohio.

Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

**CRANKSHAFTS—Forged**  
Bay City Forge Co., Erie, Pa.

Kropf Forge Co., Chicago, Ill.

Midvale Co., The, Nicetown, Phila., Pa.

**CRUSHERS—Coal**  
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

**CRUSHERS—Steel Turning**  
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

**CUTTERS—Die Sinking**  
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

Tomkins-Johnson Co., The, Jackson, Mich.

**CUTTERS—Keyseating**  
Davis Keyseater Co., 400 Exchange St., Rochester, N. Y.

**CUTTERS—Milling**  
Barber-Colman Co., Rockford, Ill.

Brown & Sharpe Mfg. Co., Providence, R. I.

Cleveland (Ohio) Twist Drill Co., The.

Morse Twist Drill & Mch. Co., New Bedford, Mass.

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

Victor Machinery Exchange, 251 Centre St., N. Y. C.

**CUTTING-OFF MACHINES—Abrasives**  
Tabor Mfg. Co., Phila.

**CUTTING-OFF MACHINES—Cold Saw**  
Espen-Lucas Mch. Wks., Philadelphia.

**CUTTING-OFF MACHINES—Pipe or Tubing**  
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Bardons & Oliver, Inc., Cleveland.

Landis Mch. Co., Inc., Waynesboro, Pa.

**CUTTING AND WELDING APPARATUS**  
—Oxy-Acetylene—See Welding and Cutting Machines and Equipment—Oxy-Acetylene.

**CYLINDERS—Compressed Air & Hydraulic**  
Hannifin Mfg. Co., Chicago.

Tomkins-Johnson Co., The, Jackson, Mich.

**CYLINDERS—Seamless**  
Harrisburg (Pa.) Steel Corp.

Midvale Co., The, Nicetown, Phila., Pa.

National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

**DEGREASING MACHINES—Solvent**  
Detroit Rex Products Co., Detroit, Mich.

**DEOXIDIZERS**  
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

**DICTATING MACHINES**  
Dictaphone Corp., 420 Lexington Ave., N. Y. C.

**DIE BLOCKS—Drop Hammer**  
Heppenstall Co., Pittsburgh.

Kropf Forge Co., Chicago, Ill.

**DIE CASTING MACHINES**  
Reed-Prentice Corp., Worcester, Mass.

**DIE FILING MACHINES**  
Harvey Mfg. Corp., 161 Grand St., New York City.

**DIE SINKING MACHINES — Automatic and Hand**  
Cincinnati (Ohio) Milling Mch. Co., The.

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

**DIES, JIGS, FIXTURES, etc.**  
Barth Stamping & Mch. Wks., Cleveland.

Taft-Pelree Mfg. Co., The, Woonsocket, R. I.

**DIES—Cast Tool Steel**  
Advance Foundry Co., The, Dayton, Ohio.

**DIES—Pipe Threading**  
Acme Machinery Co., The, Cleveland.

Eastern Mach. Screw Corp., New Haven, Ct.

Greenfield (Mass.) Tap & Die Corp.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

National Acme Co., The, Cleveland.

**DIES—Resistance Welding**  
Mallory, P. R. & Co., Inc., Indianapolis, Ind.

**DIES—Screw and Thread Cutting**  
Acme Machinery Co., The, Cleveland.

Eastern Mach. Screw Corp., New Haven, Ct.

Greenfield (Mass.) Tap & Die Corp.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

National Acme Co., The, Cleveland.

**DIES—Self-Opening Adjustable**  
Acme Machinery Co., The, Cleveland.

Eastern Mach. Screw Corp., New Haven, Ct.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

National Acme Co., The, Cleveland.

**DIES—Sheet Metal Working**  
Cimatool Co., The, Dayton, Ohio.

Worcester (Mass.) Stamped Metal Co., 6 Hunt St.

**DIES—Steel Letters and Stamps**  
Cunningham, M. E. Co., Pittsburgh, Pa.

Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

**DOORS & SHUTTERS, Fireproof**  
Kinnear Mfg. Co., Columbus, Ohio.

**DOORS & SHUTTERS—Steel or Wood Rolling**  
Kinnear Mfg. Co., Columbus, Ohio.

**DRAW BENCHES**  
McKay Machine Co., The, Youngstown, Ohio.

**DRAWN WORK—Metal—See Stampings or Drawings—Metal**

**DRILL HEADS—Hydraulic**  
National Automatic Tool Co., Richmond, Ind.

**DRILL HEADS—Multiple**  
Baker Bros., Inc., Toledo, Ohio.

**DRILLING MACHINES—Bench**  
Leland-Gifford Co., Worcester, Mass.

**DRILLING MACHINES—Heavy Duty**  
Baker Bros., Inc., Toledo, Ohio.

Barnes Drill Co., 815-831 Chestnut St., Rockford, Ill.

**DRILLING MACHINES—Multiple Spindle**  
Baker Bros., Inc., Toledo, Ohio.

Barnes Drill Co., 815-831 Chestnut St., Rockford, Ill.

National Automatic Tool Co., Richmond, Ind.

**DRILLING MACHINES—Multiple Spindle Horizontal**  
Baker Bros., Inc., Toledo, Ohio.

National Automatic Tool Co., Richmond, Ind.

**DRILLING MACHINES—Portable Electric**  
Millers Falls Co., Greenfield, Mass.

**DRILLING MACHINES—Portable Pneumatic**  
Helwig Mfg. Co., St. Paul, Minn.

Warner & Swasey Co., The, Cleveland.

**DRILLING MACHINES—Radial**  
Bryant Machinery & Engineering Co., Chicago.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleveland (Ohio) Punch & Shear Works Co., The.

**DRILLING MACHINES—Sensitive**  
Buffalo (N. Y.) Forge Co., 492 Broadway.

Leland-Gifford Co., Worcester, Mass.

**DRILLING MACHINES—Upright**  
Baker Bros., Inc., Toledo, Ohio.

Barnes Drill Co., 815-831 Chestnut St., Rockford, Ill.

Bryant Machinery & Engineering Co., Chicago.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleereman Mch. Tool Co., Green Bay, Wis.

**DRILLING MACHINES—Vertical**  
Baker Bros., Inc., Toledo, Ohio.

Barnes Drill Co., 815-831 Chestnut St., Rockford, Ill.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleereman Mch. Tool Co., Green Bay, Wis.

**DRIVES—Gear**  
Farrel-Birmingham Co., Inc., Buffalo, N. Y.

Mesta Mch. Co., Pittsburgh.

**DRIVES—Single and Multiple V-Belts**  
Allis-Chalmers Mfg. Co., Milwaukee.

**DROP FORGINGS—See Forgings—Drop Iron or Steel**

**DROP HAMMERS—See Hammers—Drop**

**DUST COLLECTORS**  
Abrasive Machine Tool Co., East Providence, R. I.

American Foundry Equipment Co., The, 510 S. Byrkit St., Milwaukee, Ind.

Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh.

Pangborn Corporation, Hagerstown, Md.

Whiting Corp., Harvey, Ill.

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# PRODUCTS INDEX

**ENGINEERS—Metallurgical**  
Gathmann Engineering Co., The, Baltimore, Md.

**ENGINES—Diesel**  
Worthington Pump & Machinery Corp., Harrison, N. J.

**ENGINES—Gas**  
Worthington Pump & Machinery Corp., Harrison, N. J.

**ENGINES—Oil**  
Worthington Pump & Machinery Corp., Harrison, N. J.

**EYELET MACHINES**  
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

**FACERS—Spot**  
Gairing Tool Co., Detroit.

**FACING CLAY**  
Carborundum Co., The, Perth Amboy, N.J.

**FACTORY & PLANT SITES**  
Zoll, Edward H., Inc., 196 Market St. Newark, N. J.

**FANS—Ventilating**  
Buffalo (N. Y.) Forge Co., 492 Broadway.

**FEED WATER HEATERS AND PURIFIERS**  
Harrisburg (Pa.) Steel Corp.

**FEEDS—Hydraulic, for Machines**  
American Engineering Co., Philadelphia.

**FELT—Wool Mechanical**  
American Felt Co., 315 Fourth Ave., N.Y.C.

**FENCING—Wire**  
Pittsburgh (Pa.) Steel Co.

**FERROALLOYS**  
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

**FERROALLOYS—Canton, Ohio**  
Ohio Ferro-Alloys Corp., Canton, Ohio.

**FERROALLOYS—Canton, Ohio**  
Samuel, Frank & Co., Inc., Philadelphia.

**FERROALLOYS—Canton, Ohio**  
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

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Samuel, Frank & Co., Inc., Philadelphia.

**FERROALLOYS—Canton, Ohio**  
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

**FLANGING WORK—Carbon and Alloy**  
Worth Steel Co., Claymont, Del.

**FLEXIBLE SHAFT EQUIPMENT**  
Strand, N. A. & Co., Chicago.

**FLOODLIGHTS—Acetylene**  
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

**FLOOR PLATES—See Plates—Floor & Ceiling**

**FLOORING—Acid Proof**  
Nukem Products Corp., 68 Niagara St. Buffalo, N. Y.

**FLOORING—Menolithe**  
Carey, Philip, Co., The, Cincinnati, Ohio.

**FLOORING—Open Steel**  
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh.

**FLOORING—Open Steel**  
Hendrick Mfg. Co., Carbondale, Pa.

**FLOORING—Open Steel**  
Kerlow Steel Flooring Co., Jersey City, N. J.

**FLOORING—Open Steel**  
Lindberg Engineering Co., 228 North Laflin St., Chicago, Ill.

**FLOORING—Open Steel**  
Rockwell, W. S., Co., 50 Church St., N.Y.C.

**FLOORING—Open Steel**  
United Engineering & Fdry. Co., Pgh.

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Lindberg Engineering Co., 228 North Laflin St., Chicago, Ill.

**FLOORING—Open Steel**  
Rockwell, W. S., Co., 50 Church St., N.Y.C.

**STEWART FURNACE DIV., Chicago Flexible Shaft Co., Chicago.**

**FURNACES—Heat Treating, Controlled Atmosphere**  
Lindberg Engineering Co., 228 North Laflin St., Chicago, Ill.

**FURNACES—Heat Treating, Cyanide or Lead**  
Electric Furnace Co., The, Salem, Ohio.

**FURNACES—Heat Treating, Electric**  
Electric Furnace Co., The, Salem, Ohio.

**FURNACES—Heat Treating, Electric**  
General Electric Co., Schenectady, N. Y.

**FURNACES—Heat Treating, Electric**  
Holcroft & Co., Detroit.

**FURNACES—Heat Treating, Electric**  
Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

**FURNACES—Heat Treating, Electric**  
Lindberg Engineering Co., 228 North Laflin St., Chicago, Ill.

**FURNACES—Heat Treating, Electric**  
Rockwell, W. S., Co., 50 Church St., N.Y.C.

**FURNACES—Heat Treating, Electric**  
Salem (Ohio) Engineering Co.

**FURNACES—Heat Treating, Electric**  
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

**FURNACES—Heat Treating, Oil or Gas**  
Electric Furnace Co., The, Salem, Ohio.

**FURNACES—Heat Treating, Oil or Gas**  
Holcroft & Co., Detroit.

**FURNACES—Heat Treating, Oil or Gas**  
Monarch Engineering & Mfg. Co., The, Baltimore, Md.

**FURNACES—Heat Treating, Oil or Gas**  
Pennsylvania Industrial Engineers, Pittsburgh.

**FURNACES—Heat Treating, Oil or Gas**  
Salem (Ohio) Engineering Co.

**FURNACES—Heat Treating, Oil or Gas**  
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

**FURNACES—Heat Treating, Oil or Gas**  
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

**FURNACES—Heat Treating, Oil or Gas**  
Electric Furnace Co., The, Salem, Ohio.

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Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.

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Lindberg Engineering Co., 228 North Laflin St., Chicago, Ill.

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Rockwell, W. S., Co., 50 Church St., N.Y.C.

**FURNACES—Heat Treating, Oil or Gas**  
United Engineering & Fdry. Co., Pgh.

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Lindberg Engineering Co., 228 North Laflin St., Chicago, Ill.

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Rockwell, W. S., Co., 50 Church St., N.Y.C.

**GEAR HOBBING MACHINES**  
Harber-Colman Co., Rockford, Ill.

**GEAR LAPPING MACHINES**  
Michigan Tool Co., Detroit, Mich.

**GEARMOTORS**  
Allis-Chalmers Mfg. Co., Milwaukee.

**GEARMOTORS**  
General Electric Co., Schenectady, N. Y.

**GEARMOTORS**  
Westinghouse Elec. & Mfg. Co., East Pgh.

**GEAR SHAVING MACHINES**  
Michigan Tool Co., Detroit, Mich.

**GEAR UNITS—Marine**  
Twin Disc Clutch Co., Racine, Wis.

**GEARS—Bevel**  
National-Erie Corp., Erie, Pa.

**GEARS—Carbon Hard-surfaced**  
Foot Bros. Gear & Machine Co., 5301 H So. Western Blvd., Chicago, Ill.

**GEARS—Heat Treated**  
Simonds Gear & Mfg. Co., Pittsburgh.

**GEARS—Helical**  
Foot Bros. Gear & Machine Co., 5301 H So. Western Blvd., Chicago, Ill.

**GEARS—Herringbone**  
Farrel-Birmingham Co., Inc., Buffalo, N.Y.

**GEARS—Machine Cut**  
National-Erie Corp., Erie, Pa.

**GEARS—Machine Molded**  
Poole Foundry & Mch. Co., Baltimore, Md.

**GEARS—Non-Metallic**  
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

**GEARS—Precision Ground**  
Foot Bros. Gear & Machine Co., 5301 H So. Western Blvd., Chicago, Ill.

**GEARS—Rawhide**  
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

**GEARS—Spur**  
Philadelphia (Pa.) Gear Works.

**GEARS—Steel, Silent**  
Waldron, John, Corp., New Brunswick, N. J.

**GEARS—Worm**  
Cone Worm Gear Div., Michigan Tool Co., Detroit, Mich.

**GENERATORS—Acetylene**  
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

**GENERATORS—Electric**  
Chicago (Ill.) Electric Co.

**GENERATORS—Electric**  
Crocker-Wheeler Electric Mfg. Co., Am-  
pore, N. J.

**GENERATORS—Electric**  
General Electric Co., Schenectady, N. Y.

**GENERATORS—Electric**  
Lincoln Electric Co., The, Cleveland.

**GENERATORS—Electric**  
Westinghouse Elec. & Mfg. Co., East Pgh.

**GENERATORS—Electric, Second Hand**  
(See Clearing House Section)

**GOGGLES—Safety**  
American Optical Co., Southbridge, Mass.

**GOVERNORS—Air Compressor**  
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

**GRABS—For Sheets and Coils**  
J-B Engineering Sales Co., 1738 Orange St., New Haven, Conn.

**GRADUATING MACHINES—Metal**  
Noble & Westbrook Mfg. Co., The, E. Hartford, Conn.

**GRATING—Flooring, Sidewalk, etc.—See**  
Flooring—Open Steel

**GREASE—Lubricating**  
Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

**GRILLES—Metal Cane**  
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

**GRILLES—Perforated Metal**  
Erdle Perforating Co., Rochester, N. Y.

**GRINDING AND POLISHING MACHINES**  
Bryant Machinery & Engineering Co., Chicago.

**GRINDING MACHINES—Centerless**  
Cincinnati (Ohio) Grinders Incorporated.

**GRINDING MACHINES—Cutter & Reamer**  
Cincinnati (Ohio) Milling Mch. Co., The, Gallmeyer & Livingston Co., Grand Rapids, Mich.

**GRINDING MACHINES—Cylinder**  
Heald Machine Co., Worcester, Mass.



## PRODUCTS INDEX

**GRINDING MACHINES—Cylindrical**  
Brown & Sharpe Mfg. Co., Providence, R.I.  
Cincinnati (Ohio) Grinders Incorporated.  
Landis Tool Co., Waynesboro, Pa.  
Norton Co., Worcester, Mass.

**GRINDING MACHINES—Die**  
Landis Mch. Co., Inc., Waynesboro, Pa.  
**GRINDING MACHINES—Drill**  
Gallmeyer & Livingston Co., Grand Rapids, Mich.

**GRINDING MACHINES—Gear & Worm**  
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

**GRINDING MACHINES—Hub**  
Barber-Colman Co., Rockford, Ill.

**GRINDING MACHINES—Internal**  
Greenfield (Mass.) Tap & Die Corp.  
Heald Machine Co., Worcester, Mass.

**GRINDING MACHINES—Internal Centerless**  
Heald Machine Co., Worcester, Mass.

**GRINDING MACHINES—Internal Multiple Spindle**  
Baird Mch. Co., The, Bridgeport, Conn.

**GRINDING MACHINES—Portable Flexible Shaft**  
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

**GRINDING MACHINES—Portable Pneumatic**  
Warner & Swasey Co., The, Cleveland.

**GRINDING MACHINES—Precision Thread**  
Jones & Lamson Machine Co., Springfield, Vt.

**GRINDING MACHINES—Roll**  
Cincinnati (Ohio) Grinders Incorporated.  
Farrel-Birmingham Co., Inc., Ansonia, Conn.

**GRINDING MACHINES—Surface**  
Abrasive Machine Tool Co., E. Prov., R. I.  
Gallmeyer & Livingston Co., Grand Rapids, Mich.

**GRINDING MACHINES—Tool**  
Cincinnati (Ohio) Milling Mch. Co., The.  
Gallmeyer & Livingston Co., Grand Rapids, Mich.

**GRINDING MACHINES—Universal**  
Cincinnati (Ohio) Grinders Incorporated.  
Landis Tool Co., Waynesboro, Pa.  
Norton Co., Worcester, Mass.

**GRINDING MACHINES—Valve**  
Landis Tool Co., Waynesboro, Pa.

**GRINDING WHEELS**  
Bakelite Corp., 247 Park Ave., New York City.

**GRIT—Steel**  
Harrison Abrasive Corp., Manchester, N. H.

**HACK SAW BLADES—See Saws—Hack Saw Blades**

**HACK SAW MACHINES**  
Armstrong-Blum Mfg. Co., Chicago.  
Peerless Machine Co., 1613 Racine St., Racine, Wis.

**HAMMER BOARDS**  
Irwin, H. G., Lumber Co., Erie, Pa.

**HAMMERS—Air, Forging**  
Chambersburg (Pa.) Engineering Co.

**HAMMERS—Drop**  
Ajax Mfg. Co., The, Cleveland.  
Billings & Spencer Co., Hartford, Conn.  
Chambersburg (Pa.) Engineering Co.  
Erie (Pa.) Foundry Co.  
Morgan Engineering Co., The, Alliance, O.

**HAMMERS—Helve**  
Bradley, C. C. & Son, Inc., Syracuse, N. Y.

**HAMMERS—Power**  
Bradley, C. C. & Son, Inc., Syracuse, N. Y.

**HAMMERS—Rawhide**  
Chicago (Ill.) Rawhide Mfg. Co., 1306 Elston Ave.

**HAMMERS—Steam**  
Chambersburg (Pa.) Engineering Co.  
Erie (Pa.) Foundry Co.  
Morgan Engineering Co., The, Alliance, O.

**HANGER BEARINGS**  
Dodge Mfg. Corp., Mishawaka, Ind.

**HANGERS—Ball Bearing**  
S K F Industries, Inc., Front St. & Erie Ave., Phila., Pa.

**HANGERS—Pressed Steel**  
American Pulley Co., Pressed Steel Stamping Div., Philadelphia.

**HANGERS—Roller Bearing**  
Hyatt Bearings Div. General Motors Corp., Newark, N. J.

**HANGERS—Shaft**  
Dodge Mfg. Corp., Mishawaka, Ind.

**HEADING MACHINES**  
Ajax Mfg. Co., The, Cleveland, Ohio.  
National Machinery Co., Tiffin, Ohio.

**HEADING MACHINES—Automatic, Electric**  
National Machinery Co., Tiffin, Ohio.  
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

**HEADS—Spun and Pressed**  
Worth Steel Co., Claymont, Del.

**HEAT TREATING**  
Barnes-Gibson-Raymond, Detroit Plant Div. of Associated Spring Corp.  
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.  
General Machine Wks., York, Pa.  
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.

**HEAT TREATING EQUIPMENT—Air Draw**  
Herrington & Randall, Inc., Detroit.

**HEATERS—Unit**  
Buffalo (N. Y.) Forge Co., 492 Broadway.

**HELMETS AND HANDSHIELDS—Welding**  
Willson Products, Inc., Reading, Pa.

**HOBS**  
Barber-Colman Co., Rockford, Ill.

**HOISTS—Air**  
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.  
Detroit (Mich.) Hoist & Mach. Co.  
Northern Engineering Works, Detroit.

**HOISTS—Chain**  
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

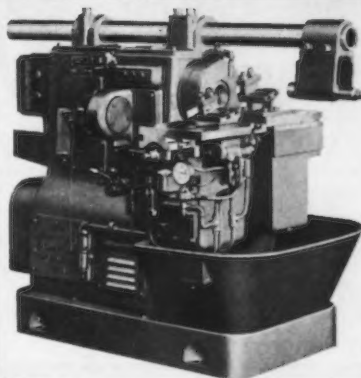
**HOISTS—Electric**  
American Engineering Co., Philadelphia.  
Conco Engineering Works, Mendota, Ill.  
Detroit (Mich.) Hoist & Mach. Co.  
Euclid Crane & Hoist Co., The, Euclid, O.  
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.  
Northern Engineering Works, Detroit, Mich.  
Philadelphia (Pa.) Gear Works.  
Robbins & Myers, Inc., Springfield, Ohio.  
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.  
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.  
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

**HOISTS—Electric Traveling**  
American Monorail Co., The, Cleveland.  
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.  
Euclid Crane & Hoist Co., The, Euclid, O.  
Northern Engineering Works, Detroit.  
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

**HOISTS—Monorail**  
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.  
Euclid Crane & Hoist Co., The, Euclid, O.  
Northern Engineering Works, Detroit.  
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

**HOISTS—Monorail**  
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.  
Euclid Crane & Hoist Co., The, Euclid, O.  
Northern Engineering Works, Detroit.  
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

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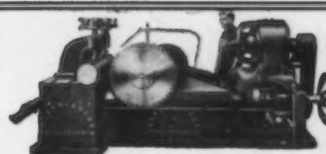
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17 STYLES AND SIZES

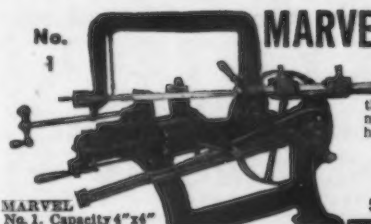
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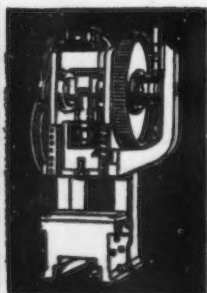
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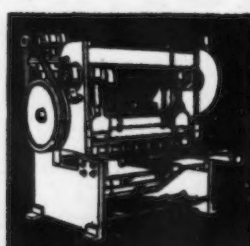
See our Advt., page 284, Jan. 5, Iron Age.  
The Eastern Machine Screw Corp.  
21-41 Barclay Street, New Haven, Conn.  
Los Angeles: A. C. Behringer, 312 Commercial St.  
Los Angeles, Cal. San Francisco: Guy Reynolds, 464  
Vernon St., Oakland, California.



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## PRODUCTS INDEX

### INSTRUMENTS—Electric

General Electric Co., Schenectady, N. Y.  
Weston Electrical Instrument Corp., New-  
ark, N. J.

### INSTRUMENTS—Recording

Leeds & Northrup Co., 4936 Stenton Ave.,  
Philadelphia.

### INSULATION

Johns-Manville Corp., 22 East 40th St.,  
New York City.

IRON—Genuine Open Hearth Iron  
Newport (Ky.) Rolling Mill Co., The,  
Div. of The Andrew Steel Co.

### IRON—Rustless

Allegheny Ludlum Steel Corp., Pittsburgh,  
Pa.

### IRON WORKERS—Universal

Buffalo (N. Y.) Forge Co., 492 Broadway.

JIGS, FIXTURES, DIES, etc. (See Dies,  
Jigs, Fixtures, etc.)

### KEYS—Riveted

Western Wire Prods. Co., St. Louis, Mo.

### KEYSEATING MACHINES

Baker Bros., Inc., Toledo, Ohio.

Davis Keyseater Co., 490 Exchange St.,  
Rochester, N. Y.

LACING—Belt, Rawhide or Leather

Chicago (Ill.) Rawhide Mfg. Co., The,  
1306 Elston Ave.

### LAMPS—Filament

General Electric Co., Cleveland.

Westinghouse Electric & Mfg. Co., Light-  
ing Div., Cleveland, Ohio.

LAMPS—Mercury Vapor

General Electric Vapor Lamp Co., Ho-  
boken, N. J.

### LAPPING MACHINES

Cincinnati (Ohio) Grinders Incorporated.

### LATHES—Automatic

Baird Mch. Co., The, Bridgeport, Conn.

Bullard Co., The, Bridgeport, Conn.

Gisholt Machine Co., Madison, Wis.

Goss & De Leeuw Mch. Co., New Britain,  
Conn.

Jones & Lamson Mch. Co., Springfield, Vt.

LeBlond, R. K. Mch. Tool Co., Cincinnati.

Monarch Mch. Tool Co., The, Sidney, O.

Potter & Johnston Machine Co., Pawtucket,

Sundstrand Machine Tool Co., Rockford,  
Ill.

### LATHES—Automatic Vertical

Baird Mch. Co., The, Bridgeport, Conn.

Bullard Co., The, Bridgeport, Conn.

Gisholt Machine Co., Madison, Wis.

### LATHES—Bench

Pratt & Whitney Div. Niles-Bement-Pond  
Co., Hartford, Conn.

South Bend (Ind.) Lathe Works, 587  
East Madison St.

### LATHES—Brass

Warner & Swasey Co., The, Cleveland.

### LATHES—Chucking

Jones & Lamson Mch. Co., Springfield, Vt.

Potter & Johnston Machine Co., Pawtucket,  
R. I.

### LATHES—Contour Turning

Monarch Mch. Tool Co., The, Sidney, O.

### LATHES—Crankshaft

LeBlond, R. K. Mch. Tool Co., Cincinnati.

Potter & Johnston Machine Co., Pawtucket,  
R. I.

### LATHES—Engine

Bryant Machinery & Engineering Co.,  
Chicago.

Cincinnati (Ohio) Lathe & Tool Co.

Hill-Clarke Mch. Co., 647 W. Washing-  
ton Blvd., Chicago.

LeBlond, R. K. Mch. Tool Co., Cincinnati.

Pratt & Whitney Div. Niles-Bement-Pond  
Co., Hartford, Conn.

Reed-Prentice Corp., Worcester, Mass.

South Bend (Ind.) Lathe Works, 587  
East Madison St.

### LATHES—Roll

Continental Roll & Steel Foundry Co.,  
East Chicago, Ind.

Lewis Foundry & Machine Div. of Blaw-  
Knox Co., Pittsburgh.

Mesta Mch. Co., Pittsburgh.

United Engineering & Fdry. Co., Pgh.  
(See Clearing  
House Section)

### LATHES—Toolroom

Cincinnati (Ohio) Lathe & Tool Co.

LeBlond, R. K. Machine Tool Co., Cin-  
cinnati, Ohio.

Monarch Mch. Tool Co., The, Sidney, O.

Pratt & Whitney Div. Niles-Bement-Pond  
Co., Hartford, Conn.

South Bend (Ind.) Lathe Works, 587  
East Madison St.

### LATHES—Turret

Acme Machine Tool Co., The, Cincinnati,  
Ohio.

Bardons & Oliver, Inc., Cleveland.

Bullard Co., The, Bridgeport, Conn.

Gisholt Machine Co., Madison, Wis.

Jones & Lamson Mch. Co., Springfield, Vt.

Potter & Johnston Machine Co., Pawtucket,  
R. I.

### LATHES—Vertical

Warner & Swasey Co., The, Cleveland.

Bullard Co., The, Bridgeport, Conn.

### LAYOUT FLUID

Dayton Rogers Mfg. Co., Minneapolis,  
Minn.

### LEAD LININGS

National Lead Co., 111 Bdway., N. Y. C.

### LEAD—In Oil

National Lead Co., 111 Bdway., N. Y. C.

### LEAD—Tellurium

National Lead Co., 111 Bdway., N. Y. C.

### LEATHER—Cup

Chicago (Ill.) Rawhide Mfg. Co., The,  
1306 Elston Ave.

### LEVELING MACHINES

Aetna-Standard Engineering Co., The,  
Youngstown, Ohio.

McKay Machine Co., The, Youngstown,  
Ohio.

Schatts Mfg. Co., The, Poughkeepsie, N. Y.

Wean Engineering Co., Inc., The, Warren, O.

### LOCOMOTIVES—Electric

Atlas Car & Mfg. Co., The, Cleveland.

Davenport (Iowa) Locomotive Works, a  
Division of Davenport Besler Corp.

LOCOMOTIVES—Gas-Electric

Davenport (Iowa) Locomotive Works, a  
Division of Davenport Besler Corp.

LOCOMOTIVES—Industrial

Davenport (Iowa) Locomotive Works, a  
Division of Davenport Besler Corp.

LOCOMOTIVES—Steam

Iron & Steel Products, Inc., Chicago.

LOCOMOTIVES—Storage Battery

Atlas Car & Mfg. Co., The, Cleveland.

LUBRICANTS—Crusher & Grinding

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

### LUBRICANTS—Gear

Cities Service Oil Co., 60 Wall Tower,  
N. Y. C.

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Standard Oil Co. (Indiana), Chicago.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

LUBRICANTS—High Pressure &  
Temperature

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Penola, Inc., Pittsburgh.

Pure Oil Co., The, Chicago.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Standard Oil Co. (Indiana), Chicago.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

### LUBRICANTS—Mine Cars

Cities Service Oil Co., 60 Wall Tower,  
N. Y. C.

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

LUBRICANTS—Mining Machines

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Standard Oil Co. (Indiana), Chicago.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

### LUBRICANTS—Roll Neck—Anti-Friction & Plain

Cities Service Oil Co., 60 Wall Tower,  
N. Y. C.

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Standard Oil Co. (Indiana), Chicago.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

### LUBRICANTS—Tipple & Cleaning

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.



## PRODUCTS INDEX

Sun Oil Co., Philadelphia.  
Texas Company, The, 135 East 42nd St.,  
N. Y. C.  
Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

### MACHINE WORK

Dodge Mfg. Corp., Mishawaka, Ind.  
Foote Bros. Gear & Machine Co., 5301  
H So. Western Blvd., Chicago, Ill.  
General Machine Works, York, Pa.  
Taft-Petree Mfg. Co., The, Woonsocket, R. I.

### MACHINERY DEALERS—Second-Hand (See Clearing House Section)

### MACHINISTS' SMALL TOOLS

Brown & Sharpe Mfg. Co., Providence,  
R. I.

Millers Falls Co., Greenfield, Mass.

MAGNESITE—Brick or Dead Burnt  
Carborundum Co., The, Perth Amboy, N. J.

### MAGNESIUM

Dow Chemical Co., The, 921 Jefferson Ave.,  
Midland, Mich.

MAGNETS—Lifting

Cutler-Hammer, Inc., Milwaukee.  
Dings Magnetic Separator Co., 727 Smith  
St., Milwaukee.

Electric Controller & Mfg. Co., The, Cleve.  
Kiekhoefer Corp., Cedarburg, Wisc.

Ohio Electric Mfg. Co., The, 5908 Maurie  
Ave., Cleveland.

MAGNETS—Separating—See Separators  
—Magnetic

MALLETS—Rawhide

Chicago (Ill.) Rawhide Mfg. Co., The,  
1306 Elston Ave.

MANDRELS—Expanding

Nicholson, W. H., & Co., 165 Oregon St.,  
Wilkes-Barre, Pa.

MANGANESE METAL AND ALLOYS

Electro Metallurgical Sales Corp., 30 East  
42nd St., N. Y. C.

MANHOLE FITTINGS AND SADDLES

Worth Steel Co., Claymont, Del.

MANIFOLDS—Oxygen & Acetylene

Air Reduction Sales Co., 60 East 42nd  
St., N. Y. C.

Linde Air Products Company, The, 30 East  
42nd St., N. Y. C.

MARKING MACHINES

Noble & Westbrook Mfg. Co., The, East  
Hartford, Conn.

METAL NAME PLATES

Grammes, L. F., & Sons, Inc., Allentown,  
Pa.

METAL SPECIALTIES

Crosby Co., The, Buffalo, N. Y.  
Torrington (Conn.) Company.

Whitehead Stamping Co., 1869 W. Lafay-  
ette Blvd., Detroit, Mich.

Worcester (Mass.) Stamped Metal Co., 6  
Hunt St.

METERS—Electric Welding

Lincoln Electric Co., The, Cleveland.

METERS—Flow

Leeds & Northrup Co., 4956 Stenton Ave.,  
Philadelphia.

METERS—Water & Oil

Worthington Pump & Machinery Corp.,  
Harrison, N. J.

MICROMETERS—Dial for Sheet Metal

Haines Gauge Co., The, Phila., Pa.

MILLING MACHINES—Automatic

Cincinnati (Ohio) Milling Mch. Co., The,  
Kearney & Trecker Corp., Milwaukee.

Potter & Johnston Machine Co., Pawtucket,  
R. I.

MILLING MACHINES—Bench

Sundstrand Machine Tool Co., Rockford,  
Ill.

MILLING MACHINES—Horizontal

Brown & Sharpe Mfg. Co., Prov., R. I.  
Cincinnati (Ohio) Milling Mch. Co., The,  
Kearney & Trecker Corp., Milwaukee.

Potter & Johnston Machine Co., Pawtucket,  
R. I.

Sundstrand Machine Tool Co., Rockford,  
Ill.

MILLING MACHINES—Planer Type

Cincinnati (Ohio) Planer Co.

MILLING MACHINES—Second-Hand,  
(See Clearing House Section)

MILLING MACHINES—Vertical

Brown & Sharpe Mfg. Co., Prov., R. I.  
Cincinnati (Ohio) Milling Mch. Co., The,  
Kearney & Trecker Corp., Milwaukee.

Potter & Johnston Machine Co., Pawtucket,  
R. I.

Reed-Prentice Corp., Worcester, Mass.

MODELS

Barth Stamping & Machine Works, Cleve-  
land, Ohio.

MOLDING MACHINES

Tabor Mfg. Co., Phila., Pa.

MONEL METAL

International Nickel Co., Inc., The, 67  
Wall St., N. Y. C.

MONORAIL SYSTEMS—Hand & Electric

American Monorail Co., The, Cleveland.  
Cleveland Tramrail Div. of The Cleveland  
Crane & Engng. Co., Wickliffe, Ohio.

MOTOR-GENERATOR SETS

Crocker-Wheeler Electric Mfg. Co., Am-  
pere, N. J.

MOTORS—Electric

Allis-Chalmers Mfg. Co., Milwaukee.  
Chicago (Ill.) Electric Co.  
Crocker-Wheeler Electric Mfg. Co., Am-  
pere, N. J.  
General Electric Co., Schenectady, N. Y.  
Harnischfeger Corp., 4401 W. National  
Ave., Milwaukee.  
Lincoln Electric Co., Cleveland.  
Westinghouse Elec. & Mfg. Co., E. Pgh.  
MOTORS—Electric, Second-Hand, (See  
Clearing House Section)

NAILS—Wire

American Steel & Wire Co. (U. S. Steel  
Corp. Subsidiary), Cleveland.  
Columbia Steel Co. (U. S. Steel Corp.  
Subsidiary), San Francisco, Calif.

Grammes, L. F., & Sons, Inc., Allentown,  
Pa.

Hassall, John, Inc., Clay & Oakland sts.,  
Bklyn., N. Y.

Pittsburgh (Pa.) Steel Co.

Wickwire Brothers, Cortland, N. Y.  
Youngstown (Ohio) Sheet & Tube Co., The

NIBBLING MACHINES

Gray Machine Co., Philadelphia.

NICKEL

International Nickel Co., Inc., The, 67  
Wall St., N. Y. C.

NITROGEN

Air Reduction Sales Co., 60 East 42nd  
St., N. Y. C.

NOZZLES—Sand Blasting

Norton Co., Worcester, Mass.

NUMBERING MACHINES—For Metal

Noble & Westbrook Mfg. Co., The, East  
Hartford, Ct.

NUT MACHINERY

Denison Engineering Co., The, Columbus,  
Ohio.

NUT MACHINERY—Automatic Cold  
Pressed

Waterbury (Conn.) Farrel Foundry & Ma-  
chine Co., The.

NUT MAKING MACHINERY

National Machinery Co., Tiffin, Ohio.

NUTS—Castellated

National Acme Co., The, Cleveland.  
Russell, Burdall & Ward Bolt & Nut  
Co., Port Chester, N. Y.

NUTS—Lock

Elastic Stop Nut Corp., Elizabeth, N. J.  
Standard Pressed Steel Co., Jenkintown,  
Pa.

NUTS—Machine Screw

Progressive Mfg. Co., Torrington, Conn.

NUTS—Semi-Finished

Cleveland (Ohio) Cap Screw Co., The,  
Russell, Burdall & Ward Bolt & Nut  
Co., Port Chester, N. Y.

NUTS—Wing

Parker-Kalon Corp., 200 Varick St.,  
N. Y. C.

OIL & GREASE SEALS

Chicago (Ill.) Rawhide Mfg. Co., The,  
1306 Elston Ave.

Garlock Packing Co., The, Palmyra, N. Y.

OIL RETAINERS

Chicago (Ill.) Rawhide Mfg. Co., The,  
1306 Elston Ave.

OIL STONES

Carborundum Co., The, Niagara Falls,  
N. Y.

Norton Co., Worcester, Mass.

OILS—Cutting

Cities Service Oil Co., 60 Wall Tower,  
N. Y. C.

Penola, Inc., Pittsburgh.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Standard Oil Co. (Indiana), Chicago, Ill.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

OILS—Fuel

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Standard Oil Co. (Indiana), Chicago, Ill.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

OILS—Lubricating

Cities Service Oil Co., 60 Wall Tower,  
N. Y. C.

Gulf Oil Corp., Gulf Refining Co., Pitts-  
burgh.

Pure Oil Co., The, Chicago.

Shell's Industrial Lubricants Div., Shell  
Bldg., San Francisco, Shell Bldg.,  
St. Louis, & 50 W. 50th St., N. Y. C.

Standard Oil Co. (Indiana), Chicago.

Texas Company, The, 135 East 42nd St.,  
N. Y. C.

Tide Water Associated Oil Co., 17 Battery  
Place, N. Y. C.

OILS—Soluble—See Oils—Cutting

ORES—Iron

Cleveland-Cliffs Iron Co., The, Cleveland,  
Ohio.

ORES—Manganese

Sojuzgolexport, Kallaveskaja Ulitsa 5,  
Moscow 6, U. S. S. R.

OVENS—Coke and By-Product Recovery

Koppers Co., Engineering & Construction  
Div., Pittsburgh.

OVENS—Core and Mold

Herrington & Randall, Inc., Detroit.  
Holcroft & Co., Detroit.

Monarch Engineering & Mfg. Co., The,  
Baltimore, Md.

OVENS—Enameling and Japanning

Carborundum Co., The, Perth Amboy,  
N. J.  
Herrington & Randall, Inc., Detroit.

OVY-ACETYLENE—Shape-Cutting Ma-  
chines

Air Reduction Sales Co., 60 East 42nd  
St., N. Y. C.  
Linde Air Products Company, The, 30 East  
42nd St., N. Y. C.

OXYGEN

Air Reduction Sales Co., 60 East 42nd  
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Linde Air Products Company, The, 30 East  
42nd St., N. Y. C.

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Garlock Packing Co., The, Palmyra, N. Y.

**PACKING—Locomotive Cylinder**  
Koppers Co., American Hammered Piston  
Ring Div., Baltimore, Md.

**PACKING—Metallie**  
Garlock Packing Co., The, Palmyra, N. Y.  
**PACKING—Rubber**  
Goodrich, B. F. Co., The, Akron, Ohio.  
Manhattan Rubber Mfg. Div. of Ray-  
bestos-Manhattan, Inc., The, 2 Townsend  
St., Passaic, N. J.

**PACKING—Sheet, Asbestos or Rubber**  
Carey, Philip, Co., The, Cincinnati, Ohio.  
Garlock Packing Co., The, Palmyra, N. Y.  
Hewitt Rubber Corp., Buffalo, N. Y.  
Johns-Manville Corp., 22 East 40th St.,  
New York City.

**PAINT**  
Koppers Co., Tar & Chemical Div., Pitts-  
burgh, Pa.  
National Lead Co., 111 Bdw., N. Y. C.  
Sipe, James B. & Co., Pittsburgh.

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Grammes, L. F., & Sons, Inc., Allentown,  
Pa.

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Dearborn, Mich.

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Chicago Perforating Co., 2440 W 24th  
Place, Chicago, Ill.  
Erdle Perforating Co., Rochester, N. Y.  
Harrington & King Perforating Co., Chi-  
cago.

**Hendrick Mfg. Co., Carbondale, Pa.**  
Mundt, Chas. & Sons, 59 Fairmount  
Ave., Jersey City, N. J.  
Wickwire Spencer Steel Co., 500 Fifth  
Ave., N. Y. C.

**PICKLING COMPOUNDS**  
American Chemical Paint Co., Ambler, Pa.  
**PICKLING MACHINES**  
Aetna-Standard Engineering Co., The,  
Youngstown, Ohio.

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Celcote Co., The, Cleveland.  
Hell & Co., Cleveland.

**National Lead Co., 111 Bdw., N. Y. C.**  
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**Brooks, E. & G., Iron Co., Birdsboro, Pa.**  
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**cago.**  
**Hanna Furnace Corp., The, Ecorse, De-**  
**troit, Mich.**

**Jackson (Ohio) Iron & Steel Co., The.**  
**Jones & Laughlin Steel Corp., Pittsburgh.**  
**Republic Steel Corp., Cleveland, Ohio.**

**Tennessee Coal, Iron & Railroad Co.**  
**(U. S. Steel Corp. Subsidiary), Birming-**  
**ham, Ala.**

**PIG IRON CASTING PLANTS**  
Herl & Patterson, Inc., Pittsburgh.

**PILING—Steel Pipe**  
National Tube Co. (U. S. Steel Corp.  
Subsidiary), Pittsburgh.

**PILING—Steel Sheet**  
American Rolling Mill Co., Middletown,  
Ohio.

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**Corp. Subsidiary), Pittsburgh & Chi-**

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**PILLOW BLOCKS**  
Dodge Mfg. Corp., Mishawaka, Ind.

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Foote Bros. Gear & Machine Co., 5301 H  
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**PINIONS—Rolling Mill**  
Continental Roll & Steel Foundry Co.,  
East Chicago, Ind.

**Mesta Mch. Co., Pittsburgh.**  
**PINIONS—Wire and Rod**  
Rathbone, A. R. & J., Palmer, Mass.

**PINS—Cotter**  
Lamson & Sessions Co., The, Cleveland.

**PIPE—Cast Iron, B. & S. & Flanged**  
Wood, R. D. & Co., Philadelphia.

**PIPE—Hammer Welded**  
National Tube Co. (U. S. Steel Corp.  
Subsidiary), Pittsburgh.

**PIPE—Lead**  
National Lead Co., 111 Bdw., N. Y. C.

**PIPE—Lead Lined**  
National Lead Co., 111 Bdw., N. Y. C.

**PIPE—New and Second-Hand**  
Albert & Davidson Pipe Corp., 2nd Ave.,  
50-51st St., Bklyn., N. Y.

**PIPE—Rubber Covered**  
Goodrich, B. F. Co., The, Akron, Ohio.

**PIPE—Seamless Brass or Copper**  
American Brass Co., The, Waterbury, Conn.

**PIPE—Spiral Welded**  
American Rolling Mill Co., Middletown, O.  
Crane Co., Chicago.

**PIPE—Standard, Black and Galvanized**  
Bethlehem (Pa.) Steel Co.

**Jones & Laughlin Steel Corp., Pittsburgh.**  
**National Tube Co. (U. S. Steel Corp.**  
**Subsidiary), Pittsburgh.**

**Republic Steel Corp., Cleveland, Ohio.**  
**PIPE—Welded, Electric**  
National Tube Co. (U. S. Steel Corp.  
Subsidiary), Pittsburgh.

**PIPE COVERING—Asbestos**  
Johns-Manville Corp., 22 East 40th St.,  
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**PIPE FITTINGS**  
Crane Co., Chicago.  
Jarecki Mfg. Co., Erie, Pa.

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**CHINES**  
Aetna-Standard Engineering Co., The,  
Youngstown, Ohio.

**Jarecki Mfg. Co., Erie, Pa.**  
**Landis, Mach. Co., Inc., Waynesboro, Pa.**  
**Merrill Mfg. Co., Toledo.**

**Taylor-Wilson Mfg. Co., McKees Rocks, Pa.**  
**PISTON RINGS**  
Koppers Co., American Hammered Piston  
Ring Div., Baltimore, Md.

**PLANERS**  
Cincinnati (Ohio) Planer Co.

**PLANERS—Plate**  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

**PLANERS—Rotary**  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

**Espen-Lucas Mch. Wks., Philadelphia.**  
**PLANING MACHINES—Second Hand.**  
**(See Clearing House Section)**

**PLASTICS—Laminated**  
Bakelite Corp., 247 Park Ave., New York  
City.

**PLASTICS—Moulded**  
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**PLASTICS—Synthetic**  
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**Corp. Subsidiary), Pittsburgh & Chi-**

**cago.**  
**Inland Steel Co., Chicago.**

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Alan Wood Steel Co., Conshohocken, Pa.

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**Carnegie-Illinois Steel Corp. (U. S. Steel**  
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**Jones & Laughlin Steel Corp., Pittsburgh.**

**Ryerson, Joseph T., & Son, Inc., Chicago.**  
**Tennessee Coal, Iron & Railroad Co.**  
**(U. S. Steel Corp. Subsidiary), Birming-**

**ham, Ala.**  
**Worth Steel Co., Claymont, Del.**

**Youngstown (Ohio) Sheet & Tube Co., The.**  
**PLATFORMS—Skid**  
Standard Pressed Steel Co., Jenkintown,  
Pa.

**PLUGS—Core Hole**  
Hubbard, M. D., Spring Co., 745 Central  
Ave., Pontiac, Mich.

**POLISHING & BUFFING MACHINES—**  
**Automatic**  
Packer Machine Co., The, Meriden, Conn.

**POLISHING COMPOUND—Stainless**  
**Steel**  
Harrison & Co., Haverhill, Mass.

**POLISHING MACHINES**  
Packer Machine Co., The, Meriden, Conn.

**POLISHING MACHINES—Band**  
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ington Ave., Minneapolis, Minn.

**POLISHING MACHINES—Bar**  
Medart Co., The, St. Louis, Mo.

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**POWER TRANSMITTING MACHINERY**  
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**POWER UNITS—Rotary**  
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**New Departure Div., General Motors Corp.,**  
**Bristol, Conn.**

**POWER UNITS—Straight Line**  
Cushman Chuck Co., Hartford, Conn.

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Pangborn Corporation, Hagerstown, Md.

**PRESS BRAKES—See Brakes—Metal**  
**Forming**

**PRESS FEEDS—Automatic**  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

**Littell, F. J., Mch. Co., Chicago.**  
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Squires & Duane Sts., Corland, N. Y.

**Detroit (Mich.) Stamping Co.**  
**Stanley Works, The, New Britain, Conn.;**  
**Bridgeport, Conn.**

**Transue & Williams Steel Forging Corp.,**  
**Alliance, Ohio.**

**Whitehead Stamping Co., 1669 W. Lafay-**  
**ette Blvd., Detroit, Mich.**

**PRESSED STEEL PARTS**  
Crosby Co., The, Buffalo, N. Y.

**Lansing (Mich.) Stamping Co., So. Penn Ave.**  
**Parish Pressed Steel Co., Reading, Pa.**

**Stanley Works, The, New Britain, Conn.**  
**Transue & Williams Steel Forging Corp.,**  
**Alliance, Ohio.**

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Co., The.

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**PRESSES—Baling, Hydraulic**  
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Philadelphia.

**PRESSES—Broaching**  
Hydraulic Press Mfg. Co., The, Mt.  
Gilead, Ohio.

**PRESSES—Coining**  
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Co., The.

**Hydraulic Press Mfg. Co., The, Mt.**  
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**National Machinery Co., Tiffin, Ohio.**

**Zeh & Hahnemann Co., Newark, N. J.**



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Tomkins-Johnson Co., The, Jackson, Mich.  
Watson Pump & Machinery Corp., Harrison, N. J.

**PUMPS—Coolant**  
Ruthman Machinery Co., Cincinnati.

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Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.  
Watson-Stillman Co., The, 103 Aldene Road, Roselle, N. J.  
Worthington Pump & Machinery Corp., Harrison, N. J.

**PUMPS—Hydraulic—Radial—Variable**  
Reversible Delivery  
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.

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Worthington Pump & Machinery Corp., Harrison, N. J.

**PUMPS—Power Transmission**  
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Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

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**PUMPS—Steam**  
Worthington Pump & Machinery Corp., Harrison, N. J.

**PUMPS—Vacuum**  
Worthington Pump & Machinery Corp., Harrison, N. J.

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Cleeland (Ohio) Punch & Shear Works Co., The.  
Cleeland Steel Tool Co., The, 660 E. 32d St., Cleveland, Ohio.

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Bertsch & Co., Cambridge City, Ind.  
Buffalo (N. Y.) Forge Co., 492 Broadway, Cincinnati (Ohio) Shaper Co., The.  
Cleeland (Ohio) Punch & Shear Works Co., The.  
Ebsor Tool & Mach. Co., E. St. Louis, Ill.  
Niagara Machine & Tools Works, Buffalo, N. Y.  
Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
Thomas Mach. Mfg. Co., Pittsburgh.  
WOMERTON MFG. CO., INC.,  
Hoskins Mfg. Co., Detroit, Mich.  
Leeds & Northrup Co., 4958 Stenton Ave., Philadelphia.

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
Foster, L. B. Co., Inc., Pittsburgh.  
Frank, M. K., 480 Lexington Ave., N. Y. C.  
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

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Hyman-Michaels Co., Chicago.  
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Sherwood, E. C., 50 Church St., N. Y. C.

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Petibone Mulliken Corp., Chicago.

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Greenfield (Mass.) Tap & Die Corp.  
Morse Twist Drill & Mch. Co., New Bedford, Mass.  
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

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Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

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Kronp Forge Co., Chicago, Ill.  
Midvale Co., The, Nicetown, Phila., Pa.  
Standard Steel Wks. Co., Phila., Pa.

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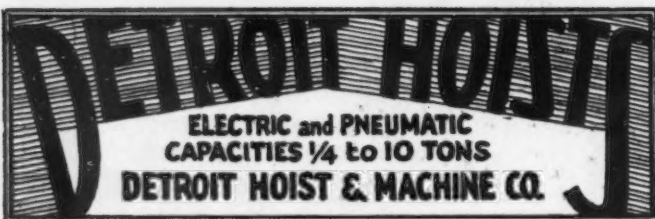


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## PRODUCTS INDEX

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American Screw Co., Providence, R. I.  
Clark Bros. Bolt Co., Middletown, Conn.  
Hassall, John, Inc., Clay & Oakland Sts.,  
Bklyn., N. Y.  
Progressive Mfg. Co., Torrington, Conn.  
Russell, Burdall & Ward Bolt & Nut  
Co., Port Chester, N. Y.  
Tubular Rivet & Stud Co., Wollaston,  
Mass.

### ROCK BITS

Timken Roller Bearing Co., Canton, Ohio.  
RODS—Aluminum  
Aluminum Co. of America, Pittsburgh.

### RODS—Brass

American Brass Co., The, Waterbury, Conn.

### RODS—Connecting

Kropp Forge Co., Chicago, Ill.

### RODS—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave.,  
Midland, Mich.

### RODS—Nickel Silver

American Brass Co., The, Waterbury, Conn.

### RODS—Phosphor Bronze

American Brass Co., The, Waterbury, Conn.

### RODS—Rustless

Buschless Iron & Steel Corp., Baltimore, Md.

### RODS—Welding

Air Reduction Sales Co., 60 East 42nd  
St., N. Y. C.

American Brass Co., The, Waterbury, Conn.

American Steel & Wire Co. (U. S. Steel  
Corp. Subsidiary), Cleveland.

Harnischfeger Corp., 4401 W. National  
Ave., Milwaukee.

Lincoln Electric Co., The, Cleveland.

Linde Air Products Company, The, 30 East  
42nd St., N. Y. C.

Metal & Thermit Corp., 120 Broadway,  
N. Y. C.

Pittsburgh (Pa.) Steel Co.

Titan Metal Mfg. Co., Bellefonte, Pa.

RODS—Wire  
American Steel & Wire Co. (U. S. Steel  
Corp. Subsidiary), Cleveland.

Bethlehem (Pa.) Steel Co.

Jones & Laughlin Steel Corp., Pittsburgh.

Pittsburgh (Pa.) Steel Co.

Wickwire Brothers, Cortland, N. Y.

Wickwire Spencer Steel Co., 500 Fifth  
Ave., N. Y. C.

Youngstown (Ohio) Sheet & Tube Co., The.

ROLLING MACHINERY—Cold Rolling  
Continental Roll & Steel Foundry Co.,  
East Chicago, Ind.

Lewis Foundry & Machine Div. of Blaw-  
Knox Co., Pittsburgh.

United Engineering & Fdry. Co., Pith.

ROLLING MACHINERY—Sheet Metal  
Continental Roll & Steel Foundry Co.,  
East Chicago, Ind.

Lewis Foundry & Machine Div. of Blaw-  
Knox Co., Pittsburgh.

ROLLING MILL MACHINERY  
Aetna-Standard Engineering Co., The,  
Youngstown, Ohio.

Birdsboro (Pa.) Steel Foundry & Machine  
Co.

Continental Roll & Steel Fdry. Co., East  
Chicago, Ind.

Farrel-Birmingham Co., Inc., Ansonia, Ct.

Lewis Foundry & Machine Div. of Blaw-  
Knox Co., Pittsburgh.

McKay Machine Co., The, Youngstown,  
Ohio.

Mesta Mch. Co., Pittsburgh.

Morgan Construction Co., Worcester, Mass.

Morgan Engineering Co., The, Alliance, O.

National Roll & Fdry. Co., Avonmore, Pa.

United Engineering & Fdry. Co., Pith.

Waterbury (Ct.) Farrel Fdry. & Mch. Co.,  
The.

ROLLS—Alloy Steel  
Continental Roll & Steel Fdry. Co., East  
Chicago, Ind.

Ohio Steel Foundry Co., Lima, Ohio.

Pittsburgh Rolls Div. of Blaw-Knox Co.,  
Pittsburgh.

ROLLS—Bending and Straightening  
Haldwin-Southark Corp., Southark Div.,  
Philadelphia.

Bertsch & Co., Cambridge City, Ind.

Cleveland (Ohio) Punch & Shear Works  
Co., The.

Lake Erie Engineering Corp., 68 Kenmore  
Sta., Buffalo, N. Y.

McKay Machine Co., The, Youngstown,  
Ohio.

Niagara Machine & Tool Works, Buffalo,  
N. Y.

Scharr Mfg. Co., The, Poughkeepsie, N. Y.

ROLLS—Forging  
Ajax Mfg. Co., The, Cleveland.

ROLLS—Rubber Covered  
Goodrich, B. F. Co., The, Akron, Ohio.

Hewitt Rubber Corp., Buffalo, N. Y.

Manhattan Rubber Mfg. Div. of Ray-  
bestos-Manhattan, Inc., The, 2 Town-  
send St., Passaic, N. J.

ROLLS—Sand Chilled Iron and Steel  
Aetna-Standard Engineering Co., The,  
Youngstown, Ohio.

Birdsboro (Pa.) Steel Foundry & Machine  
Co.

Continental Roll & Steel Fdry. Co., East  
Chicago, Ind.

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Knox Co., Pittsburgh.

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Ohio Steel Foundry Co., Lima, Ohio.

Pittsburgh Rolls Div. of Blaw-Knox Co.,  
Pittsburgh.

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ROLLS—Special Hardened  
Bethlehem (Pa.) Steel Co.

Foot Bros. Gear & Machine Co., 5301 H  
So. Western Blvd., Chicago, Ill.

Midvale Co., The, Nicetown, Phila., Pa.

### ROOFING MATERIALS

Carey, Philip, Co., The, Cincinnati, Ohio.

### ROOFING—Coal Tar Pitch

Koppers Co., Tar & Chemical Div., Pitts-  
burgh, Pa.

### ROOFING—Special Copper Bearing Steel

Superior Sheet Steel Co., Canton, Ohio.

### ROOFING AND SIDING—Corrugated and Plain

American Rolling Mill Co., Middletown, O.

Carey, Philip, Co., The, Cincinnati, Ohio.

Carnegie-Illinois Steel Corp. (U. S. Steel  
Corp. Subsidiary), Pittsburgh & Chi-  
cago.

Johns-Manville Corp., 22 East 40th St.,  
New York City.

Newport (Ky.) Rolling Mill Co., The,  
Div. of The Andrews Steel Co.

ROOFING AND SIDING—Iron and Steel  
Inland Steel Co., Chicago.

Newport (Ky.) Rolling Mill Co., The,  
Div. of The Andrews Steel Co.

ROOFING & SIDING—(Zinc)—Corrugated &  
Plain  
New Jersey Zinc Co., The, 160 Front St.,  
N. Y. C.

### RUBBER LININGS

Goodrich, B. F. Co., The, Akron, Ohio.

### RUBBER MOLDED PARTS

Manhattan Rubber Mfg. Div. of Ray-  
bestos-Manhattan, Inc., The, 2 Town-  
send St., Passaic, N. J.

### RUST PREVENTIVES

American Chemical Paint Co., Ambler, Pa.

American Lanolin Corp., Lawrence, Mass.

Parker Rust Proof Co., 2186 Milwaukee  
Ave., Detroit.

RUST PROOFING COMPOUNDS  
Parker Rust Proof Co., 2186 Milwaukee  
Ave., Detroit.

RUST PROOFING PROCESS  
American Chemical Paint Co., Ambler, Pa.

Parker Rust Proof Co., 2186 Milwaukee  
Ave., Detroit.

### SALT CANDY

Hardie Brothers Co., Pittsburgh, Pa.

### SALT TABLETS

Morton Salt Co., Chicago, Ill.

### SAND BLAST EQUIPMENT & MACHINES

American Foundry Equipment Co., The,  
510 S. Byrkit St., Mishawaka, Ind.

Pangborn Corporation, Hagerstown, Md.

SAND BLAST STEEL SHOT  
American Foundry Equipment Co., The,  
510 S. Byrkit St., Mishawaka, Ind.

Harrison Abrasive Corp., Manchester,  
N. H.

Pangborn Corporation, Hagerstown, Md.

Pittsburgh (Pa.) Crushed Steel Co.

SAND HANDLING EQUIPMENT  
Link-Belt Co., 300 West Pershing Road,  
Chicago, Ill.

### SAWING MACHINES—Metal

Espan-Lucas Mch. Works, Phila.

Peerless Machine Co., 1613 Racine St.,  
Racine, Wis.

### SAWING MACHINES—Metal—Band

Continental Machines, Inc., 1311 S. Wash-  
ington Ave., Minneapolis, Minn.

### SAWS—Band and Hack for Metal

Armstrong-Blum Mfg. Co., Chicago.

Atkins, E. C. & Co., Indianapolis.

Diston, Henry, & Sons, Inc., Philadelphia.

SAWS—Circular, Rip & Cutoff  
Atkins, E. C. & Co., Indianapolis.

SAWS—Fretting  
Atkins, E. C. & Co., Indianapolis.

SAWS—Hack Saw Blades  
Atkins, E. C. & Co., Indianapolis.

Millers Falls Co., Greenfield, Mass.

Peerless Machine Co., 1613 Racine St.,  
Racine, Wis.

### SAWS—Hot Metal

Ajax Mfg. Co., The, Cleveland.

Atkins, E. C. & Co., Indianapolis.

Diston, Henry, & Sons, Inc., Philadelphia.

SAWS—Inserted Tooth, Cold  
Diston, Henry, & Sons, Inc., Philadelphia.

Tabor Mfg. Co., Philadelphia.

### SAWS—Milling

Atkins, E. C. & Co., Indianapolis.

Diston, Henry, & Sons, Inc., Philadelphia.

SAWS—Screw Slitting  
Harber-Colman Co., Rockford, Ill.

### SCREENS—Perforated Metal

Chicago Perforating Co., 2440 W. 24th  
Place, Chicago, Ill.

Erdle Perforating Co., Rochester, N. Y.

Harrington & King Perforating Co., Chi-  
cago.

Hendrick Mfg. Co., Carbondale, Pa.

Mundt, Chas. & Sons, 59 Fairmount  
Ave., Jersey City, N. J.

### SCREENS—Woven Wire

Ludlow-Saylor Wire Co., St. Louis, Mo.

Wickwire Brothers, Cortland, N. Y.

Wickwire Spencer Steel Co., 500 Fifth  
Ave., N. Y. C.

### SCREW MACHINE PRODUCTS

Barnes, Wallace Co., The, Div. of Asso-  
ciated Spring Corp., Bristol, Conn.

Commonwealth Brass Corp., Detroit.

Defiance Screw Machine Prods Div. of  
The Serick Corp., Defiance, Ohio.

Eastern Mch. Screw Corp., New Haven.

National Aetna Co., The, Cleveland.

New Britain-Gridley Machine Div., The  
New Britain Machine Co., New Britain,  
Conn.

Olson Mfg. Co., Worcester, Mass.

Ottomiller, Wm. H., Co., Inc., York, Pa.

Shimer, Samuel J., & Sons, Inc., Milton,  
Pa.

### SCREW MACHINERY—Automatic

Brown & Sharpe Mfg. Co., Providence  
R. I.

National Aetna Co., The, Cleveland.



## PRODUCTS INDEX

New Britain-Gridley Machine Div., The  
New Britain Machine Co., New Britain,  
Conn.

**SCREW MACHINERY—Hand**  
Warner & Swasey Co., The, Cleveland.

**SCREW MACHINERY—Multiple Spindle**  
Acme Machine Tool Co., The, Cincinnati,  
Ohio.

National Acme Co., The, Cleveland.

**SCREW STOCK**  
Bliss & Laughlin, Inc., Harvey, Ill.;  
Buffalo, N. Y.

Jones & Laughlin Steel Corp., Pittsburgh.  
LaSalle Steel Co., Chicago.

Union Drawn Steel Div. Republic Steel  
Corp., Massillon, Ohio.

**SCREWS—Cap**  
Cleveland (Ohio) Cap Screw Co., The.  
Lamson & Sessions Co., The, Cleveland.

National Acme Co., The, Cleveland.  
Ottemiller, Wm. H. Co., Inc., York, Pa.

Triplex Screw Co., Cleveland.

**SCREWS—Coach or Lag**  
Lamson & Sessions Co., The, Cleveland.

**SCREWS—Machine**  
Lamson & Sessions Co., The, Cleveland.  
Progressive Mfg. Co., The, Torrington, Ct.

Shlmer, Samuel J. & Sons, Inc., Milton,  
Pa.

Triplex Screw Co., Cleveland.

**SCREWS—Machine, Recessed Head**  
American Screw Co., Providence, R. I.

**SCREWS—Safety Set**  
Parker-Kalon Corp., 200 Varick St.,  
N. Y. C.

Standard Pressed Steel Co., Jenkintown, Pa.

**SCREWS—Set**  
Cleveland (Ohio) Cap Screw Co., The.  
National Acme Co., The, Cleveland.

Ottemiller, Wm. H. Co., Inc., York, Pa.

**SCREWS—Sheet Metal, Recessed Head**  
American Screw Co., Providence, R. I.

**SCREWS, Socket, Head, Cap**  
Parker-Kalon Corp., 200 Varick St.,  
N. Y. C.

Standard Pressed Steel Co., Jenkintown, Pa.

**SCREWS—Thumb**  
Parker-Kalon Corp., 200 Varick St.,  
N. Y. C.

**SCREWS—Weed, Recessed Head**  
American Screw Co., Providence, R. I.

**SCRIBERS**  
Ford Motor Co. (C. E. Johanson Div.),  
Dearborn, Mich.

**SCRUBBING MACHINES—Sheet**  
Wean Engineering Co., Inc., The, Warren,  
Ohio.

**SCYTHE STONES AND WHETSTONES**  
Carborundum Co., The, Niagara Falls, N. Y.

**SECOND - HAND MACHINERY—(See  
Clearing House Section)**

**SEPARATORS—Magnetic**  
Dings Magnetic Separator Co., 727 Smith  
St., Milwaukee.

Kiekhaefer Corp., Cedarburg, Wis.  
Ohio Electric Mfg. Co., The, 5908 Maurice  
Ave., Cleveland.

Stearns Magnetic Mfg. Co., 635 So. 28th  
St., Milwaukee.

**SHAFTS—Carbon Hard-surfaced**  
Foote Bros. Gear & Machine Co., 5301 H  
So. Western Blvd., Chicago, Ill.

**SHAFTING—Cold Drawn**  
Bliss & Laughlin, Inc., Harvey, Ill.;  
Buffalo, N. Y.

LaSalle Steel Co., Chicago.  
Union Drawn Steel Div. Republic Steel  
Corp., Massillon, Ohio.

**SHAFTING—Forged**  
Ray City Forge Co., Erie, Pa.

**SHAFTING—Steel**  
Bliss & Laughlin, Inc., Harvey, Ill.;  
Buffalo, N. Y.

LaSalle Steel Co., Chicago.  
Union Drawn Steel Div. Republic Steel  
Corp., Massillon, Ohio.

**SHAFTING—Turned and Ground**  
Bliss & Laughlin, Inc., Harvey, Ill.;  
Buffalo, N. Y.

Jones & Laughlin Steel Corp., Pittsburgh.  
LaSalle Steel Co., Chicago.

Ryerson, Jos. T. & Son, Inc., Chicago.  
Union Drawn Steel Div. Republic Steel  
Corp., Massillon, Ohio.

**SHAPERS**  
Cincinnati (Ohio) Shaper Co., The.

**SHAPERS—Horizontal**  
Smith & Mills Co., Cincinnati, Ohio.

**SHAPERS—Vertical**  
Pratt & Whitney Div. Niles-Bement-Pond  
Co., Hartford, Conn.

**SHAPES—Cold Drawn**  
Bliss & Laughlin, Inc., Harvey, Ill.;  
Buffalo, N. Y.

Jones & Laughlin Steel Corp., Pittsburgh.  
Union Drawn Steel Div. Republic Steel  
Corp., Massillon, Ohio.

**SHAPES—Wire**  
Accurate Spring Mfg. Co., 3811 W. Lake  
St., Chicago.

American Spring & Mfg. Corp., Holly,  
Mich.  
Cuyahoga Spring Co., The, Cleveland.  
Eastern Tool & Mfg. Co., Bloomfield, N. J.

Grammes, L. F. & Sons, Inc., Allentown,  
Pa.

Lee Spring Co., Inc., 30 Main St., Brook-  
lyn, N. Y.

Roebbing's, John A. Sons Co., Trenton,  
N. J.

**SHEAR BLADES & KNIVES**  
American Shear Knife Co., Homestead, Pa.  
Canton Fdry. & Mch. Co., Cleveland.  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

Heppenstall Co., Pittsburgh.

**SHEARING MACHINES—Alligator**  
Canton Fdry. & Mch. Co., Cleveland.

**SHEARING MACHINES—Angle, Hand  
and Power**  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

Federal Bearings Co., Inc., The, Pough-  
keepsie, N. Y.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

**SHEARING MACHINES—Bar**  
Buffalo (N. Y.) Forge Co., 492 Broadway,  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
United Engineering & Fdry. Co., Pgh.

**SHEARING MACHINES—Beam and  
Channel**  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
United Engineering & Fdry. Co., Pgh.

**SHEARING MACHINES—Billet**  
Morgan Engineering Co., The, Alliance, O.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
Thomas Machine Mfg. Co., Pittsburgh.

United Engineering & Fdry. Co., Pgh.

**SHEARING MACHINES—Continuous  
Sheet & Pack**  
Aetna-Standard Engineering Co., The,  
Youngstown, Ohio.

Cleveland (Ohio) Punch & Shear Works  
Co., The.

**SHEARING MACHINES—Plate**  
Berlich & Co., Cambridge City, Ind.

Cincinnati (Ohio) Shaper Co., The.  
Cleveland (Ohio) Punch & Shear Works  
Co., The.

Mesta Mch. Co., Pittsburgh.  
Morgan Engineering Co., The, Alliance, O.

Niagara Machine & Tool Works, Buffalo,  
N. Y.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
Thomas Machine Mfg. Co., Pittsburgh.

United Engineering & Fdry. Co., Pgh.

**SHEARING MACHINES—Sheet and  
Plate**  
Cincinnati (Ohio) Shaper Co., The.

Cleveland (Ohio) Punch & Shear Works  
Co., The.

Niagara Mach. & Tool Wks., Buffalo, N. Y.

**SHEARING MACHINES—Squaring**  
Cincinnati (Ohio) Shaper Co., The.

Cleveland (Ohio) Punch & Shear Works  
Co., The.

Niagara Mach. & Tool Wks., Buffalo, N. Y.

**SHEET BARS**  
Andrews Steel Co., The, Newport, Ky.

**SHEET LIFTERS**  
Cullen-Friedrich Co., 1303 S. Kilbourn  
Ave., Chicago.

**SHEET METAL MACHINERY**  
Cincinnati (Ohio) Shaper Co., The.

Cleveland (Ohio) Punch & Shear Works  
Co., The.

Dreis & Krump Mfg. Co., Chicago.

Ferracute Machine Co., Bridgeton, New  
Jersey.

New Albany (Ind.) Mch. Mfg. Co.  
Niagara Mach. & Tool Wks., Buffalo, N. Y.

V & O Press Co., Hudson, N. Y.

Waterbury (Conn.) Farrel Foundry & Ma-  
chine Co., The.

**SHEETS—Aluminum**  
Aluminum Co. of America, Pittsburgh.

**SHEETS—Auto Body**  
American Rolling Mill Co., Middletown, O.

Bethlehem (Pa.) Steel Co.  
Carnegie-Illinois Steel Corp. (U. S. Steel  
Corp. Subsidiary), Pittsburgh & Chi-  
cago.

Inland Steel Co., Chicago.  
Republic Steel Corp., Cleveland, Ohio.

Youngstown (Ohio) Sheet & Tube Co., The.

**SHEETS—Black**  
American Rolling Mill Co., Middletown, O.

Carnegie-Illinois Steel Corp. (U. S. Steel  
Corp. Subsidiary), Pittsburgh & Chi-  
cago.

Columbia Steel Co. (U. S. Steel Corp.  
Subsidiary), San Francisco, Calif.

Granite City (Ill.) Steel Co.  
Ingersoll Steel & Disc Div. Borg-Warner  
Corp., Chicago.

Inland Steel Co., Chicago.  
Jones & Laughlin Steel Corp., Pittsburgh.

Newport (Ky.) Rolling Mill Co., The.  
Div. of The Andrews Steel Co.

Republic Steel Corp., Cleveland, Ohio.

Ryerson, Jos. T. & Son, Inc., Chicago.

Worth Steel Co., Claymont, Del.

**SHEETS—Brass, Bronze, Copper, Nickel,  
Silver or Phosphor Bronze**  
American Brass Co., The, Waterbury, Conn.

**SHEETS—Chrome**  
Carnegie-Illinois Steel Corp. (U. S. Steel  
Corp. Subsidiary), Pittsburgh & Chi-  
cago.

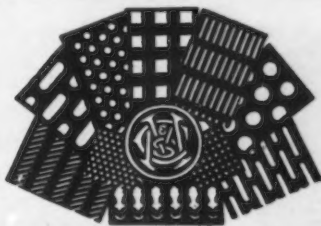
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 American Rolling Mill Co., Middletown, O.  
 Bethlehem (Pa.) Steel Co.  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Granite City (Ill.) Steel Co.  
 Great Lakes Steel Corp., Ecorse, Detroit.  
 Inland Steel Co., Chicago.  
 Jones & Laughlin Steel Corp., Pittsburgh.  
 Republic Steel Corp., Cleveland, Ohio.  
 Ryerson, Jos. T., & Son, Inc., Chicago.  
 Weirton (W. Va.) Steel Co.  
**SHEETS—Copper Alloy**  
 American Brass Co., The Waterbury, Conn.  
**SHEETS—Copper Steel**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Granite City (Ill.) Steel Co.  
 Inland Steel Co., Chicago.  
**SHEETS—Electrical**  
 American Rolling Mill Co., Middletown, O.  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Granite City (Ill.) Steel Co.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
 Republic Steel Corp., Cleveland, Ohio.  
**SHEETS—Enameling**  
 American Rolling Mill Co., Middletown, O.  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.  
 Granite City (Ill.) Steel Co.  
 Inland Steel Co., Chicago.  
 Jones & Laughlin Steel Corp., Pittsburgh.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
**SHEETS—For Drawing and Stamping**  
 American Rolling Mill Co., Middletown, O.  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Granite City (Ill.) Steel Co.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
 Republic Steel Corp., Cleveland, Ohio.  
 Ryerson, Jos. T., & Son, Inc., Chicago.  
 Superior Steel Co., Canton, Ohio.  
 Worth Steel Co., Claymont, Del.  
**SHEETS—Full Finished**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Granite City (Ill.) Steel Co.  
 Republic Steel Corp., Cleveland, Ohio.  
**SHEETS—Galvanized, Flat and Corrugated**  
 American Rolling Mill Co., Middletown, O.  
 Bethlehem (Pa.) Steel Co.  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.  
 Continental Steel Corp., Kokomo, Ind.  
 Granite City (Ill.) Steel Co.  
 Great Lakes Steel Corp., Ecorse, Detroit, Mich.  
 Inland Steel Co., Chicago.  
 Jones & Laughlin Steel Corp., Pittsburgh.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
 Republic Steel Corp., Cleveland, Ohio.  
 Ryerson, Jos. T., & Son, Inc., Chicago.  
 Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.  
 Weirton (W. Va.) Steel Co.  
 Youngstown (Ohio) Sheet & Tube Co., The.  
**SHEETS—Galvannealed**  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
**SHEETS—Hot Rolled Pickled**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
**SHEETS—Lead**  
 National Lead Co., 111 Bdway., N. Y. C.  
**SHEETS—Long Terme**  
 American Rolling Mill Co., Middletown, Ohio.  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
**SHEETS—Magnesium Alloys**  
 Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.  
**SHEETS—Metal Furniture**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Republic Steel Corp., Cleveland, Ohio.  
**SHEETS—Tin Mill Black**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Granite City (Ill.) Steel Co.  
 Newport (Ky.) Rolling Mill Co., The Div. of The Andrews Steel Co.  
**SHEETS—Zinc**  
 New Jersey Zinc Co., The, 160 Front St., N. Y. C.  
**SHOP FURNITURE**  
 New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.  
**SHOVELS—Mounted—See Cranes**  
**SHUTTERS—Steel & Wood Bi-Folding**  
 Kinnear Mfg. Co., Columbus, Ohio.

**SILICO—MANGANESE**  
 Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.  
**SILICON METAL & ALLOYS**  
 Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.  
**SINE BARS**  
 Ford Motor Co. (C. E. Johanson Div.), Dearborn, Mich.  
**SLABS**  
 Andrews Steel Co., The, Newport, Ky.  
**SLINGS—Wire Rope**  
 Hoebing's, John A., Sons Co., Trenton, N. J.  
**SLITTERS—Gang**  
 McKay Machine Co., The, Youngstown, Ohio.  
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 Detroit Rex Products Co., Detroit, Mich.  
**SPECIAL MACHINERY**  
 Baldwin-Southwark Corp., Southwark Div., Philadelphia.  
 Barth Stamping & Machine Works, Cleveland, Ohio.  
 Birdsboro (Pa.) Steel Foundry & Machine Co.  
 Bullard Co., The, Bridgeport, Conn.  
 Denison Engineering Co., The, Columbus, Ohio.  
 Dodge Mfg. Corp., Mishawaka, Ind.  
 Eastern Tool & Mfg. Co., Bloomfield, N. J.  
 Morgan Engineering Co., The, Alliance, O.  
 Taft-Peires Mfg. Co., The, Woonsocket, R. I.  
 Thomas Mch. Mfg. Co., Pittsburgh.  
 Whiting Corp., Harvey, Ill.  
 Wood, B. D., & Co., Philadelphia.  
**SPEED REDUCERS**  
 Foote Bros. Gear & Machine Co., 5301 H So. Western Blvd., Chicago, Ill.  
 Link-Belt Co., 2045 West Hunting Park Ave., Philadelphia, Pa.  
 Philadelphia (Pa.) Gear Works.  
 Poole Foundry & Mch. Co., Baltimore, Md.  
 Twin Disc Clutch Co., Racine, Wis.  
**SPIEGELEISEN**  
 Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.  
**SPIKES—Track**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
 Jones & Laughlin Steel Corp., Pittsburgh.  
**SPINDLES—Boring**  
 Cimatomol Co., The, Dayton, Ohio.  
**SPICE BARS**  
 Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
**SPRING MAKING MACHINERY**  
 Baird Mch. Co., The, Bridgeport, Conn.  
 Sleeper & Hartley, Inc., Worcester, Mass.  
**SPRINGS—Car**  
 Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.  
**SPRINGS—Extension, Compression, Torsion or Flat**  
 Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago.  
 Amer. Spring & Mfg. Corp., Holly, Mich.  
 American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.  
 Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.  
 Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.  
 Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.  
 Cuyahoga Spring Co., The, Cleveland.  
 Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.  
 Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.  
 Hubbard, M. D., Spring Co., 745 Central Ave., Pontiac, Mich.  
 Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.  
 Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.  
 Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.  
 U. S. Steel Wire Spring Co., Cleveland, O.  
 Wickwire Spencer Steel Co., 500 Fifth Ave., N. Y. C.  
**SPROCKETS**  
 Baldwin-Duckworth Chain Corp., Springfield, Mass.  
 Whitney Chain & Mfg. Co., Hartford, Ct.  
**STAMPINGS OR DRAWINGS—Metal**  
 Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago.  
 American Pulley Co., Pressed Steel Stamping Div., Philadelphia.  
 Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.  
 Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.  
 Champion Sheet Metal Co., Inc., cor. Squires & Duane Sts., Cortland, N. Y.  
 Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.  
 Crosby Co., The, Buffalo, N. Y.  
 Dayton Rogers Mfg. Co., Minneapolis, Minn.  
 Detroit (Mich.) Stamping Co.  
 Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.  
 Eastern Tool & Stg. Co., Inc., Saugus, Mass.  
 Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.



## PRODUCTS INDEX

Grammes, L. F., & Sons, Inc., Allentown, Pa.  
Hubbard, M. D., Spring Co., 745 Central Ave., Pontiac, Mich.  
Lansing (Mich.) Stamping Co., So. Penn. Ave.  
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.  
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.  
Parish Pressed Steel Co., Reading, Pa.  
Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.  
Sessions, J. H., & Son, Hooker Court, Bristol, Conn.  
Stanley Works, The, New Britain, Conn.  
Torrington (Conn.) Company  
Transue & Williams Steel Forging Corp., Alliance, Ohio.  
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.  
Worcester (Mass.) Pressed Steel Co., 104 Barber Ave.  
Worcester (Mass.) Stamped Metal Co., 6 Hunt St.

**STAMPS**—Steel Alphabets and Figures  
Cunningham, M. E., Co., Pittsburgh, Pa.  
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

**STAPLES**—Wire  
Wickwire Brothers, Cortland, N. Y.

**STEEL—Acid Resisting**  
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

**STEEL—Alloy**  
Alan Wood Steel Co., Conshohocken, Pa.  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.  
Andrews Steel Co., The, Newport, Ky.  
Bethlehem (Pa.) Steel Company.  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Harrisburg (Pa.) Steel Corp.  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.

Republic Steel Corp., Cleveland, Ohio.  
Ryerson, Jos. T., & Son, Inc., Chicago.  
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

Timken Roller Bearing Co., The, Canton, O.  
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.  
Vanadium-Alloys Steel Co., Latrobe, Pa.  
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.  
Youngstown (Ohio) Sheet & Tube Co., The.

**STEEL—Alloy, Cold Drawn**  
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.  
LaSalle Steel Co., Chicago.  
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.  
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

**STEEL—Bright Finished**  
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.  
LaSalle Steel Co., Chicago.  
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

**STEEL—Carbon**  
Andrews Steel Co., The, Newport, Ky.  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.

**STEEL—Carbon Hard-surfaced**  
Foote Bros. Gear & Machine Co., 5301 H So. Western Blvd., Chicago, Ill.

**STEEL—Case Hardening**  
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.

**STEEL—Chrome Molybdenum**  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.

**STEEL—Chrome Nickel**  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.

**STEEL—Chrome Nickel Silver**  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.

**STEEL—Cobalt**  
Darwin & Milner, Inc., Cleveland.

**STEEL—Cold Drawn**  
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.  
Jones & Laughlin Steel Corp., Pittsburgh.  
LaSalle Steel Co., Chicago.  
Rathbone, A. B., & J., Palmer, Mass.  
Ryerson, Joseph T., & Son, Inc., Chicago.  
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

**STEEL—Cold Rolled Strips**  
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.  
Bethlehem (Pa.) Steel Co.  
Griffin Mfg. Co., Erie, Pa.  
Jones & Laughlin Steel Corp., Pittsburgh.  
Republic Steel Corp., Cleveland, Ohio.  
Ryerson, Jos. T., & Son, Inc., Chicago.  
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.  
Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.

Steel & Tubes, Inc., Cleveland.  
Superior Steel Corp., Carnegie, Pa.  
Thomas Steel Co., The, Warren, Ohio.  
Wetherell Bros. Co., Cambridge, 39, Mass.  
Worcester (Mass.) Pressed Steel Co., 104 Barber Ave.

**STEEL—Cold Rolled Strips—Electro Brass Coated**  
Thomas Steel Co., The, Warren, Ohio.

**STEEL—Cold Rolled Strips, Electro Cap- per Coated**  
Thomas Steel Co., The, Warren, Ohio.

**STEEL—Cold Rolled Strips, Electro- Galvanized Coated**  
Thomas Steel Co., The, Warren, Ohio.

**STEEL—Cold Rolled Strips, Electro Tin Coated**  
Thomas Steel Co., The, Warren, Ohio.

**STEEL—Cold Rolled Strips, Electro Zinc Coated**  
Thomas Steel Co., The, Warren, Ohio.

**STEEL—Cold Rolled Strips, Stainless**  
Griffin Mfg. Co., Erie, Pa.

**STEEL—Corrosion Resisting**  
Midvale Co., The, Nicetown, Phila., Pa.  
Rustless Iron & Steel Corp., Baltimore, Md.  
Superior Steel Corp., Carnegie, Pa.

**STEEL—Crucible**  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.  
Vanadium-Alloys Steel Co., Latrobe, Pa.

**STEEL—Cutlery**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

**STEEL—Die**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Disston, Henry, & Sons, Inc., Philadelphia.  
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.

Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

**STEEL—Drill**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.

**STEEL—Electric**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Disston, Henry, & Sons, Inc., Philadelphia.  
Timken Roller Bearing Co., The, Canton, O.  
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

**STEEL—High Speed**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

Cleveland (Ohio) Twist Drill Co., The.  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.

Latrobe (Pa.) Electric Steel Co.  
Vanadium-Alloys Steel Co., Latrobe, Pa.

**STEEL—Hot Rolled Strips**  
Bethlehem (Pa.) Steel Co.  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Great Lakes Steel Corp., Ecorse, Detroit.  
Inland Steel Co., Chicago.

Jones & Laughlin Steel Corp., Pittsburgh.  
Laclede Steel Co., St. Louis, Mo.

Republic Steel Corp., Cleveland, Ohio.  
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.

Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.

Steel & Tubes, Inc., Cleveland.  
Superior Steel Corp., Carnegie, Pa.

**STEEL—Open Hearth**  
Andrews Steel Co., The, Newport, Ky.  
Pittsburgh (Pa.) Steel Co.

Timken Roller Bearing Co., The, Canton, O.  
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

**STEEL—Rustless**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

Griffin Mfg. Co., Erie, Pa.  
Rustless Iron & Steel Corp., Baltimore, Md.

**STEEL—Screw**  
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.

Jones & Laughlin Steel Corp., Pittsburgh.  
LaSalle Steel Co., Chicago.

Timken Roller Bearing Co., The, Canton, O.  
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

**STEEL—Special Analysis**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.

Andrews Steel Co., The, Newport, Ky.  
Bliss & Laughlin, Inc., Harvey, Ill.; Buffalo, N. Y.

Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.

Harrisburg (Pa.) Steel Corp.  
Republic Steel Corp., Cleveland, Ohio.

Timken Roller Bearing Co., The, Canton, O.  
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.



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Fig. 282



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## PRODUCTS INDEX

- STEEL—Spring**  
Barnes-Gibson-Raymond, Detroit Plants, Div. of Associated Spring Corp.  
Barnes, Wallace, Co., The, Div. of Associated Spring Corp., Bristol, Conn.  
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.  
Republic Steel Corp., Cleveland, Ohio.  
Timken Roller Bearing Co., The, Canton, O.  
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.  
Youngstown (Ohio) Sheet & Tube Co., The.
- STEEL—Stainless**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.  
American Rolling Mill Co., Middletown, O.  
Bethlehem (Pa.) Steel Company.  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Diston, Henry, & Sons, Inc., Philadelphia, La. (Pa.) Electric Steel Co.  
Republic Steel Corp., Cleveland, Ohio.  
Rustless Iron & Steel Corp., Baltimore, Md.  
Ryerson, Jos. T., & Son, Inc., Chicago.  
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.  
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.  
Wetherill Bros. Co., Cambridge, 39, Mass.
- STEEL—Stainless Clad**  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.
- STEEL—Tool**  
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.  
Bethlehem (Pa.) Steel Company.  
Crucible Steel Co. of America, Chrysler Bldg., N. Y. C.  
Darwin & Milner, Inc., Cleveland.  
Diston, Henry, & Sons, Inc., Philadelphia, Pa.  
Firth-Sterling Steel Co., McKeesport, Pa.  
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.  
Jensco, Wm., & Sons, Inc., 121 Varick St., N. Y. C.  
Midvale Co., The, Nicetown, Phila., Pa.  
Ryerson, Jos. T., & Son, Inc., Chicago.  
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.  
Vanadium-Alloys Steel Co., Latrobe, Pa.  
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
- STEEL MILL EQUIPMENT**  
Wellman Engineering Co., The, Cleveland.
- STEEL PLANTS AND ROLLING MILLS**  
Brassett, H. A., & Co., Chicago, Ill.
- STEEL ROLLS**  
Continental Roll & Steel Foundry Co., East Chicago, Ind.  
United Engineering & Fdry. Co., Pgh.
- STOKERS**  
Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.  
Whiting Corp., Harvey, Ill.
- STRAIGHT EDGES**  
Ford Motor Co. (C. E. Johansson Div.), Dearborn, Mich.
- STRAIGHTENING AND DRAWING MACHINES—For Bars**  
Ajax Mfg. Co., The, Cleveland.
- STRAIGHTENING MACHINES—Bar & Tube**  
Aetna-Standard Engineering Co., The, Youngstown, Ohio.  
Medart Co., The, St. Louis, Mo.
- STRAIGHTENING MACHINES—Wire**  
Lewis Machine Co., The, Cleveland.  
Shuster, F. B., Co., The, New Haven, Conn.
- STRUCTURAL IRON AND STEEL WORK**  
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.  
Bethlehem (Pa.) Steel Co.  
Morgan Engineering Co., The, Alliance, O.
- STRUCTURAL STEEL—See Angles, Beams, Channels and Tees**
- SUPERHEATERS**  
Babcock & Wilcox Co., The, 85 Liberty St., N. Y. C.
- SWAGING MACHINES**  
Torrington (Conn.) Company.
- SWITCHES—Electric**  
Westinghouse Elec. & Mfg. Co., East Pgh.
- TANK LININGS**  
Celcote Co., The, Cleveland.  
Nukem Prods. Corp., 68 Niagara St., Buffalo, N. Y.
- TANK LININGS—Rubber**  
Goodrich, B. F., Co., The, Akron, Ohio.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
- TANKS—Alkal Cleaning**  
Detroit Rex Products Co., Detroit, Mich.
- TANKS—Compressed Air, Gas, Oil and Water**  
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.
- TANKS—Iron and Steel**  
Koppers Co., Bartlett Hayward Div., Baltimore, Md.
- TANKS—Pickling**  
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh.
- Cleveland (Ohio) Quarries Co., The.**  
Goodrich, B. F., Co., The, Akron, Ohio.  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.  
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.
- TANKS—Rubber Lined**  
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh.
- Goodrich, B. F., Co., The, Akron, Ohio.**  
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
- TANKS—Welded**  
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh.
- National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.**
- TAPPING MACHINES**  
Acme Machinery Co., The, Cleveland.  
Haker Bros. Inc., Toledo, Ohio.  
Barnes Drill Co., 815-831 Chestnut St., Rockford, Ill.
- National Automatic Tool Co., Richmond, Ind.**  
Waterbury (Conn.) Farrel Fdry. & Mch. Co.
- TAPPING MACHINES—Nuts**  
National Machinery Co., Tiffin, Ohio.
- TAPS—Collapsing**  
Landis Mch. Co., Inc., Waynesboro, Pa.  
National Acme Co., The, Cleveland.
- TAPS AND DIES**  
Greenfield (Mass.) Tap & Die Corp.  
Landis Mch. Co., Inc., Waynesboro, Pa.  
Morris Twist Drill & Mch. Co., New Bedford, Mass.
- Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.**  
Victor Machinery Exchange, 251 Centre St., N. Y. C.
- TEES—See Angles, Beams, Channels and Tees**
- TERMINALS—Plain & Lock**  
Thompson-Bremer & Co., Chicago.
- TERNE PLATES**  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
- TESTING MACHINES—Hardness**  
Shore Instrument & Mfg. Co., The, Jamaica, L. I., N. Y.
- TESTING MACHINES—Materials**  
Baldwin-Southwark Corp., Southwark Div., Phila.
- THERMOMETERS**  
Weston Electrical Instrument Corp., Newark, N. J.
- THERMOMETERS—Recording**  
Leeds & Northrup Co., 4956 Stenton Ave., Philadelphia.
- THREAD CUTTING TOOLS—See Dies, Taps**
- THREAD ROLLING MACHINES**  
Wilson, A. H., Mch. Co., Bridgeport, Ct.  
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.
- THREADING MACHINES**  
Acme Machinery Co., The, Cleveland.  
Eastern Mesh. Screw Corp., New Haven, Conn.
- Landis Mch. Co., Inc., Waynesboro, Pa.**  
National Machinery Co., Tiffin, Ohio.
- THREADING MACHINES—Automatic**  
Landis Mch. Co., Inc., Waynesboro, Pa.
- TIE PLATES**  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
- Jones & Laughlin Steel Corp., Pittsburgh.**
- TIN PLATE**  
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.  
Granite City (Ill.) Steel Co.  
Inland Steel Co., Chicago.  
Jones & Laughlin Steel Corp., Pittsburgh.  
Republic Steel Corp., Cleveland, Ohio.  
Weirton (W. Va.) Steel Co.  
Youngstown (Ohio) Sheet & Tube Co., The.
- TIN PLATE MACHINERY**  
Aetna-Standard Engineering Co., The, Youngstown, Ohio.  
Wean Engineering Co., Inc., The, Warren, Ohio.
- TINNING EQUIPMENT—Sheets**  
Wean Engineering Co., Inc., The, Warren, Ohio.
- TIPS—Spot Welding**  
Mallory, P. K., & Co., Inc., Indianapolis, Ind.
- TONGS—Automatic**  
Heppenstall Co., Pittsburgh.
- TOOL BITS**  
Carboloy Co., Inc., 11153 East 8-Mile Road, Detroit.  
McKenna Metals Co., Latrobe, Pa.
- TOOL HOLDERS**  
Armstrong Bros. Tool Co., Chicago.
- TOOLS—Lathes**  
Armstrong Bros. Tool Co., Chicago.  
Carboloy Co., Inc., 11153 East 8-Mile Road, Detroit.
- TOOLS—Metal Cutting**  
Carboloy Co., Inc., 11153 East 8-Mile Road, Detroit.  
McKenna Metals Co., Latrobe, Pa.  
Michigan Tool Co., Detroit, Mich.  
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.



## PRODUCTS INDEX

**TOOLS—Safety, Steel Stamp**  
Cunningham, M. E. Co., Pittsburgh, Pa.

**TOOLS—Tungsten Carbide**  
Carboloy Co., Inc., 11153 East 8-Mile Road, Detroit.

**TORCHES—Brazing, Cutting and Welding**  
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

**Linde Air Products Company, The, 30 East 42nd St., N. Y. C.**

**TRACTORS AND TRAILERS—See Trucks, Tractors and Trailers—Industrial**

**TRAILERS—Industrial—See Trucks, Tractors and Trailers—Industrial**

**TRAMRAILS—Overhead Systems**  
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.  
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

**TRAMWAYS—Wire Rope**  
Leschen, A., & Sons Rope Co., St. Louis, Mo.

**TRANSCRIBING MACHINES**  
Dictaphone Corp., 420 Lexington Ave., N. Y. C.

**TRANSMISSIONS—Hydraulic**  
American Engineering Co., Philadelphia.  
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

**TRANSMISSIONS—Variable Speed**  
Link-Belt Co., 2045 West Hunting Park Ave., Phila., Pa.  
Reeves Pulley Co., Columbus, Indiana.

**TRAPS—Steam**  
Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.

**TREADS—Safety**  
Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh.  
Hendrick Mfg. Co., Carbondale, Pa.  
Kerlow Steel Flooring Co., Jersey City, N. J.

**TROLLEYS**  
Curtis Pneumatic Machinery Co., 1948 Kielen Ave., St. Louis, Mo.

**TRUCKS—Dump (Industrial)**  
Clark Tractor Div., Clark Equipment Co., Battle Creek, Mich.  
Towmotor, Inc., Cleveland.

**TRUCKS—Elevating (Power)**  
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

**Clark Tractor Div., Clark Equipment Co., Battle Creek, Mich.**

**Elwell-Parker Electric Co., The, Cleveland.**

**Towmotor, Inc., Cleveland.**

**Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.**

**TRUCKS—Lift (Hand & Foot)**  
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

**TRUCKS—Scrap (Industrial)**  
Towmotor, Inc., Cleveland.

**TRUCKS, TRACTORS AND TRAILERS—Industrial**

**Atlas Car & Mfg. Co., The, Cleveland.**

**Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.**

**Clark Tractor Div., Clark Equipment Co., Battle Creek, Mich.**

**Elwell-Parker Electric Co., The, Cleveland.**

**Towmotor, Inc., Cleveland.**

**Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.**

**TUBE MILL MACHINERY**  
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

**Taylor-Wilson Mfg. Co., McKees Rocks, Pa.**

**United Engineering & Fdry. Co., Pgh. Waterbury (Conn.) Farrel Foundry & Machine Co., The.**

**TUBE MILL MACHINERY—Welded**  
McKay Machine Co., The, Youngstown, Ohio.

**TUBES—Boiler**  
Bissett Steel Co., The, Cleveland.

**Jones & Laughlin Steel Corp., Pittsburgh.**

**National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.**

**Pittsburgh (Pa.) Steel Co.**

**Steel & Tubes, Inc., Cleveland.**

**TUBES—Copper Alloy**  
American Brass Co., The, Waterbury, Conn.

**TUBES—High Carbon**  
Steel & Tubes, Inc., Cleveland.

**TUBES—Nickel Silver**  
American Brass Co., The, Waterbury, Conn.

**TUBES—Stainless Steel**  
Bissett Steel Co., The, Cleveland.

**National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.**

**TUBING—Phosphor Bronze**  
American Brass Co., The, Waterbury, Conn.

**TUBING—Seamless Steel**  
Bissett Steel Co., The, Cleveland.

**Jones & Laughlin Steel Corp., Pittsburgh.**

**National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.**

**Ohio Seamless Tube Co., The, Shelby, Ohio.**

**Pittsburgh (Pa.) Steel Co.**

**Ryerson, Jos. T., & Son, Inc., Chicago.**

**Steel & Tubes, Inc., Cleveland.**

**Timken Roller Bearing Co., The, Canton, O.**

**Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.**

**Youngstown (Ohio) Sheet & Tube Co., The.**

**TUBING—Square and Rectangular**  
Steel & Tubes, Inc., Cleveland.

**TUBING—Stainless Steel**  
Steel & Tubes, Inc., Cleveland.

**TUBING—Tinned Brass or Copper**  
Bundy Tubing Co., Detroit, Mich.

**TUBING—Tinned-Steel**  
Bundy Tubing Co., Detroit, Mich.

**TUBING—Tool Steel**  
Bissett Steel Co., The, Cleveland.

**TUBING—Welded Steel**  
Bundy Tubing Co., Detroit, Mich.

**Jones & Laughlin Steel Corp., Pittsburgh.**

**National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.**

**Ohio Seamless Tube Co., The, Shelby, Ohio.**

**Steel & Tubes, Inc., Cleveland.**

**Youngstown (Ohio) Sheet & Tube Co., The.**

**TUBULAR PRODUCTS**  
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

**Steel & Tubes, Inc., Cleveland.**

**TUMBLING BARRELS—See Barrels—Tumbling**

**TUNGSTEN METAL & ALLOYS**  
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62", 72" King

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No. 4 Colburn, 2 spdl.  
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No. D-4 Colburn Heavy Duty  
No. 314, No. 416 Baker Heavy Pattern  
No. 14 Water Multiple  
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10"x24"	10"x15" GAPx72"	16"x50"
10"x15" GAPx24"	14"x36"	16"x72"
10"x36"	14"x50"	18"x96"
20"x96"	22"x120"	

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26"x30" Boye & Emmes, Taper Attachment  
27"x12" American Geared Head, M.D.  
27"x18" Sidney, Taper Attachment  
30"x11", 15" American Geared Head  
30"x16" American, Taper Attachment  
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480 Lexington Ave. New York City 450 Fourth Ave., Pittsburgh, Pa.

## CARS SPECIAL 100—All Steel 50 Ton Hoppers

- 25—40 ton steel u/f flats.
- 20—50 ton steel u/f flats.
- 15—30 ft. all-steel Gons. Al condition.
- 200—30 ton steel u/f box cars.
- 25—50 ton all-steel Gons.
- 25—30 ton steel Gons., St. Ga. Bilt. 1936.

## LOCOMOTIVE CRANES

### Saddle Tank Locomotives

## RAILS

Complete Stocks at 90¢ 85¢ 75¢ 70¢ 65¢ 60¢ and lighter weights, with angle bars, carried at principal points throughout the country, available for rail or water shipment.

## HYMAN-MICHAELS COMPANY

122 So. Michigan Ave. Chicago

## RAILS "1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes. RELAYING RAILS—25,000 tons—All sections—All Sizes, practically as good as New.

ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Belts, Nuts, Frogs, Switches, Tie Plates. Buy from One Source—Save Time and Money. Phone, Write or Wire.

**L. B. FOSTER COMPANY, Inc.**  
PITTSBURGH NEW YORK CHICAGO

# BUSINESS OPPORTUNITIES

## Manufacturers Agents and Cutting Tool Manufacturers

Established manufacturer of non-ferrous cutting alloy of tungsten, chromium, and cobalt has revised plan of distribution and now invites inquiries from sales representatives having contacts with users of cutting materials. Worthwhile profit opportunities for active concern. State size of staff, territory covered, type of accounts. Crobalt Inc., Bellevue at E. Warren, Detroit.

## —FOR LEASE OR SALE—

### MANUFACTURING PLANT

Heavy-Mill Type Structural Steel Buildings 24,000 sq. ft. floor space. At present equipped as Grey Iron Foundry and Machine Shop. Plant site 13 acres centrally located in live Ohio River Valley Industrial Section. The best of Labor, Fuel, Power and Shipping Facilities. Abundance of coal, coke, pig iron and scrap; also finished steel sheets locally available.

Address Box T-178  
Care The Iron Age, 239 W. 39th St., New York

## "PLUG"

Patent No. 1,546,736

can be sold or license can be given together with newer patents (mass production).

Please apply to

**A. 57.687, ALA,**  
**Berlin W.35, Germany**

## X-RAY

200,000 volt industrial X-Ray laboratory for sale. High and low voltage X-Ray tubes, dark room equipment, etc., at fraction of original value.

ADDRESS BOX T-184

Care The Iron Age, 239 W. 39th St., New York

Procurement Division, Public Buildings Branch, Washington, D. C., June 10, 1939.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 25, 1939, for construction of the U. S. P. O. (East Los Angeles Branch) at Los Angeles, Calif. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$10 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., June 6, 1939.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 7, 1939, for extension and remodeling (except elevator) of the U. S. Court House and Custom House at Mobile, Ala. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$7 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.



## WANTED

**WANTED**  
**HORIZONTAL BORING MILL**  
3" or 3 1/2" bar, Lucas, Universal or Giddings Lewis.

ADDRESS BOX T-139  
Care The Iron Age, 239 W. 39th St., New York

**WANTED**  
**10 or 12 ft. toggle press or equal.**

Give description, location and price.  
The W. F. Norman Sheet Metal Mfg. Co., Nevada, Mo.

**WANTED**  
a 3/4 inch or 1 inch Steel Bed Acme or National Upsetting Machine either continuous or stop motion not more than twelve years old.

Address Box T-182  
Care The Iron Age, 239 W. 39th St., New York

2—No. 6 B & S Automatic Screw Machines, give serial.  
1—Double Crank Press to form 14 gauge stock, 120" between uprights by 50" front to back, 6" stroke or longer, 48" die height. Tie-Rod.

**D. E. DONY MACHINERY CO.**  
47 LAURELTON ROAD ROCHESTER, N. Y.

### SURPLUS STEEL INVENTORIES

Sheets—Strip—Blanks—Side and End Shearings—High Speed Steels, Stainless Steels—Spring Steels—Alloy and Plain Scrap Steels, Spring Wire—Tin Plate—All Types Bar Steels.

ADDRESS BOX T-117  
Care The Iron Age, 239 W. 39th St., New York

### MIDLAND STEEL & EQUIPMENT COMPANY

400 South Clinton Street, Chicago, Illinois

**The**  
**Largest Buyers**  
**of**  
**Surplus Steel Inventories**

## CONTRACT MANUFACTURING

### WANTED MACHINES TO MANUFACTURE

Old established machinery manufacturing concern located in the East wants to manufacture Special Machinery or parts on contract for other sellers.

ADDRESS BOX T-125  
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### STAMPINGS

Light and Medium  
Electric Spot Welding and  
Assembled Units

We specialize in designing stampings to substitute castings. Dies designed and built for quality production.

**Eastern Tool & Stamping Co., Inc.**  
39 Ballard Street, Saugus, Mass.

### SCREW MACHINE PRODUCTS

OF EVERY DESCRIPTION  
SMALLEST UP TO 2 1/4"  
HARDWARE SPECIALTIES

**OLSON MFG. CO.**  
WORCESTER, MASS.

## EMPLOYMENT EXCHANGE

### EMPLOYMENT SERVICE

#### SALARIED POSITIONS \$2,500 to \$25,000

This thoroughly organized advertising service of 29 years' recognized standing and reputation, carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been \$2,500 or more, send only name and address for details. R. W. Bixby, Inc., 274 Delward Bldg., Buffalo, N. Y.

### HELP WANTED

**WANTED—YOUNG METALLURGICAL ENGINEER** with practical experience in metallurgy and machinability investigations of alloy steels and customer's problems. Address Box T-179, care The Iron Age, 239 W. 39th St., New York.

### REPRESENTATIVES WANTED

**MANUFACTURER** of old and well established line of WIRE PRODUCTS and METAL SPECIALTIES, located in central New York State, seeks Sales Representative to contact industries and jobbing houses. Compensation will be paid on commission basis and exclusive territory given, including State of Massachusetts, Rhode Island and Eastern Connecticut. Should be handled in connection with another line. Address Box T-180, care The Iron Age, 239 W. 39th St., New York.

**WANTED: SALES ENGINEER**, with an established clientele, by a medium size well established General Plate Fabricating and Machine Base Manufacturer, all welded construction. Write Box 206, Warren, Ohio.

### ACCOUNTS WANTED

**SALES REPRESENTATIVE** of fifteen years' experience and with two good accounts is open to another mechanical or electrical line for the Ohio territory. Address Box C-1059, care The Iron Age, 1836 Euclid Ave., Cleveland, Ohio.

### SITUATIONS WANTED

**SALES EXECUTIVE**, broad technical and legal training, experienced engineer, ten years as machine-tool salesman and sales engineer. Address Box T-146, care The Iron Age, 239 W. 39th St., New York.

**MAN WITH WIDE EXPERIENCE**, sales, purchasing, expediting inspection. Forgings, castings and engineering products open for position. Location immaterial. Address Box T-164, care The Iron Age, 239 W. 39th St., New York.

**METALLURGIST: D. Sc.** Over ten years' experience in industry and teaching. DESIRES INDUSTRIAL POSITION. Excellent record and references. Address Box T-185, care The Iron Age, 239 W. 39th St., New York.

**WORKS MANAGER OR SUPERINTENDENT**; Capable mechanic; good organizer; excellent executive; versed in costs planning purchasing, manufacture and tooling. Excellent record. Location immaterial. Address Box T-186, care The Iron Age, 239 W. 39th St., New York.

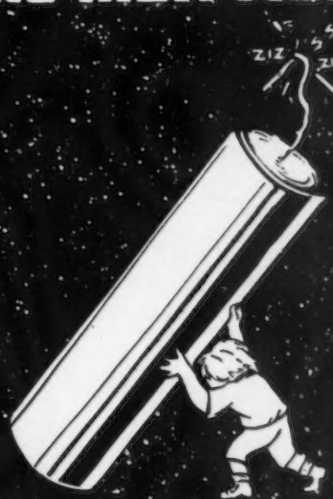
**FOUNDRY EXECUTIVE**, twenty-five years' experience steel and alloy, covering sales and production. Widely known to trade. Versed all phases of foundry and pattern shop practice. Go anywhere. Address Box T-177, care The Iron Age, 239 W. 39th St., New York.

**FIRST GRADE STEEL SALESMAN** now employed wishes to make a change in employment, in order to improve future outlook. I seek a connection with a producer of the manufacturing grades of finished and semi-finished steels, who can use an experienced representative on a mutually profitable basis. Address reply to Box T-183, care The Iron Age, 239 W. 39th St., New York.

**GENERAL SUPERINTENDENT OR MANAGER.** Can bring unusual experience and record to manufacturer with plant employing not over 2000. Forty years old, university graduate. Eighteen years' experience in manufacturing in various executive capacities, along with engineering, metallurgical, accounting and sales contact experience. At present employed. Address Box T-176, care The Iron Age, 239 W. 39th St., New York.

**STAMPING AND MANUFACTURING EXECUTIVE.** At present superintendent of metal stamping plant, technical education, thoroughly experienced in tool and production engineering, plant costs, methods, safety work and the handling of labor, also knowledge of plastic moulding and metal lithograph production. Age 40, excellent references, available July 1. Address Box T-181, care The Iron Age, 239 W. 39th St., New York.

## THE IRON AGE



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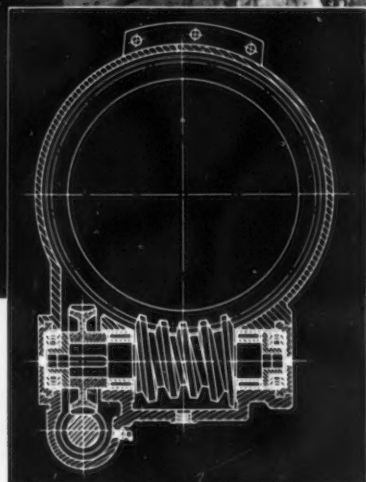
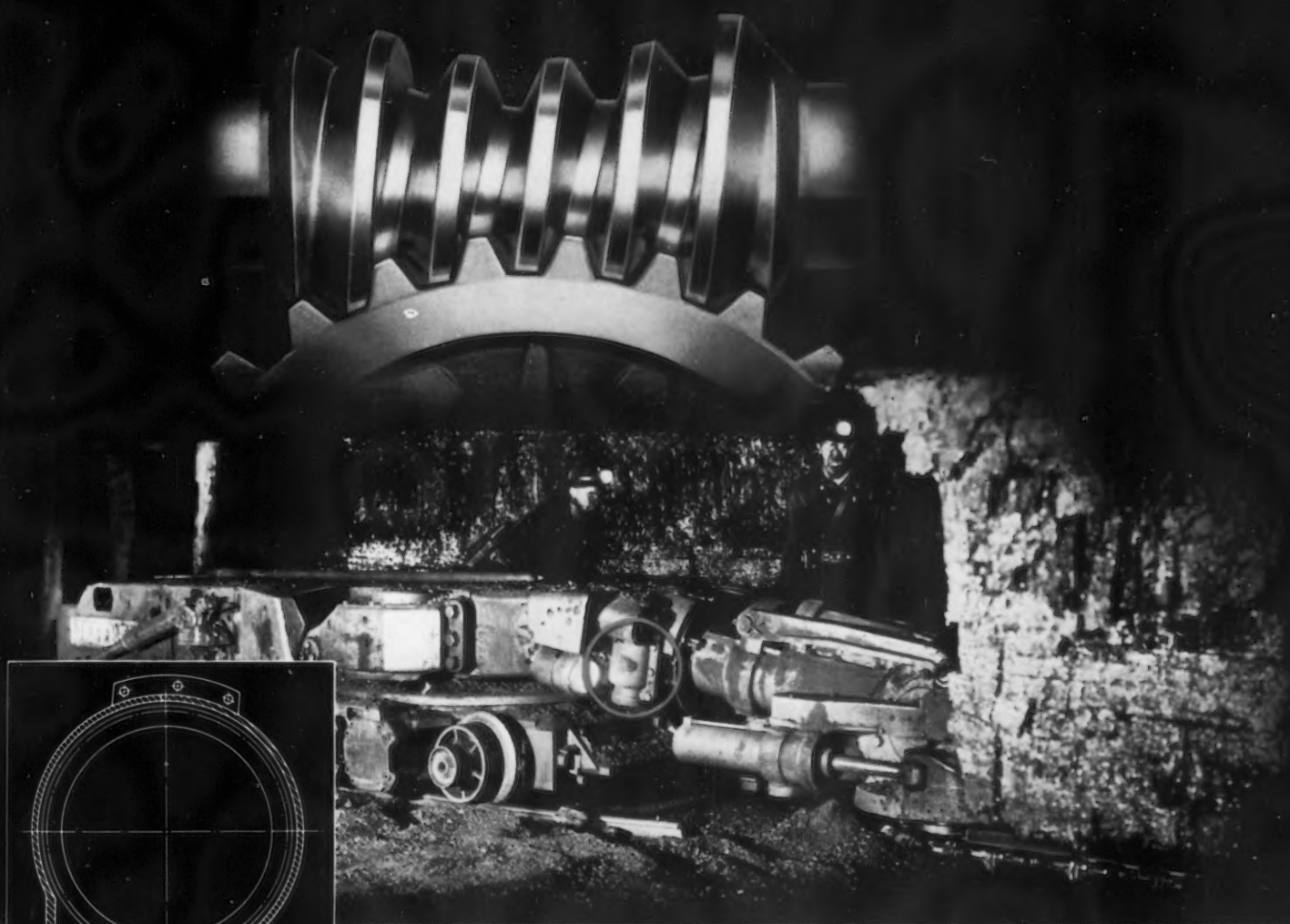
#### Can Celebrate

Advertise what you have to "sell" or to "buy". If you need men, or a position, The Iron Age can help you too.

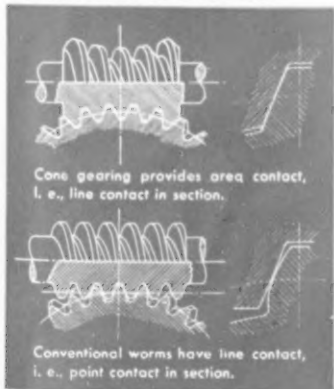
239 West 39th Street, New York







Cone Drive assembly as used in the Jeffrey 99U Universal Coal Cutter, shown above. Location of gears marked with Circle. 40 to 1 ratio, 10 inch Center Distance.



CURRENT CONE OPERATING RANGES  
Ratios..... Low, 1 to 6; High, 183 to 1  
Speed .. Low, 1/15 rpm.; High, 30,000rpm.  
Sizes (C. D.) Low, 5/8 in.; High, 27 1/2 in.

## Area-Contact Cone Drive Solves Clearance Problem

Some time ago The Jeffrey Manufacturing Company set out to design a really Universal Coal Cutter—a machine that would cut a 'room' to a width of 33 1/2 ft., and cut it faster—that would bottom-cut and top-cut—that would cut and shear room-necks and crosscuts—that would hole break-throughs and slab ribs.

For the high capacity required, conventional gearing would not give the compactness necessary to provide proper head turn-over clearance. Smaller gears were necessary. Jeffrey engineers found that: "Cone worm gearing has less unit pressure and more efficiency than straight type worm gearing and permits the use of smaller gearing."

Thus, again, Cone gearing's AREA

CONTACT—with more teeth in engagement—helped develop a better machine.

There are other important features exclusive with Cone type worm gearing. Both worm and wheel tend to regenerate each other in service, so that gears WEAR IN instead of out. Further, the engaging action of Cone worm and wheel teeth spreads oil on the contact surfaces instead of scraping it off, reducing wear, and increasing efficiency.

*Our Engineering department will be glad to cooperate with you in working out drives that will cut your machine costs, decrease size, increase load capacity and improve efficiency and durability.*

*In the meantime, we suggest you send for Bulletin #CW-3b for further details.*

**CONE WORM GEAR DIVISION MICHIGAN TOOL COMPANY**  
7171 E. McNICHOLS ROAD, DETROIT

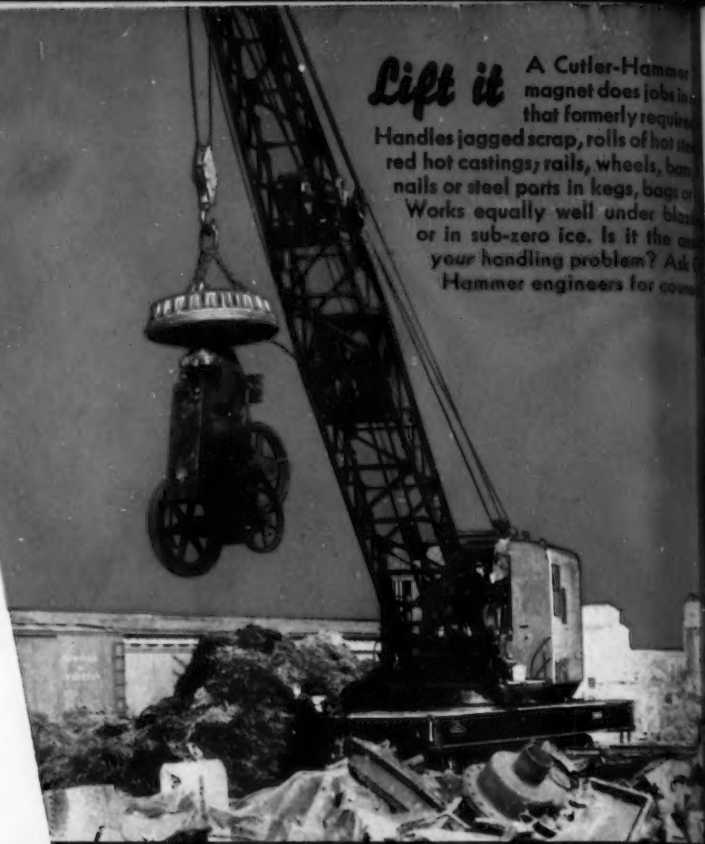
# Magnetic Miracles

How you can make easy work of many "impossible" problems

If anyone says these are not miracles, let him look at the savings many industries are making by using Cutler-Hammer electro-magnetic devices. Let him see giant machines clutched and declutched smoothly at the touch of a remote button . . . or parts of machines started and stopped in automatic cycles. Or let him see huge stacks of freezing-cold, jagged scrap metal . . . or castings red hot from the mold . . . wafted about by a C-H Lifting Magnet. Such "miracles" pay handsome dividends to people who find ways to use them. Ask a Cutler-Hammer engineer about your problem. CUTLER-HAMMER, Inc., Pioneer Electrical Manufacturers, 1262 St. Paul Avenue, Milwaukee, Wisconsin.

## Lift it

A Cutler-Hammer magnet does jobs in that formerly required red hot castings, rails, wheels, bands or steel parts in kegs, bags or Works equally well under blast or in sub-zero ice. Is it the answer to your handling problem? Ask a Cutler-Hammer engineer for more.



## Sort it

In many manufacturing processes, stray iron can cause much trouble. It can damage machines, demoralize production. It can contaminate chemicals, foodstuffs or many other substances in process. You may have any one of a dozen reasons for using a Cutler-Hammer Magnetic Separator. Why not discuss your problem with a qualified expert. Write for a Cutler-Hammer engineer.



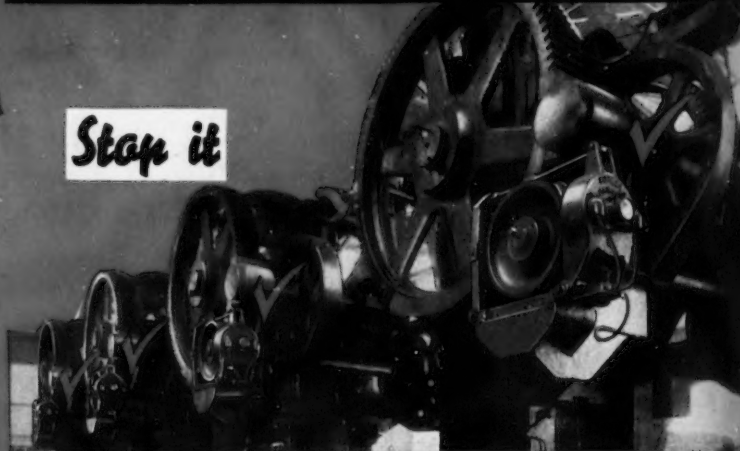
## Control it

Many problems of machine performance find their answer in a Cutler-Hammer Magnetic Clutch. It provides every function of a mechanical clutch with many extra advantages. Definitely cushioned action. Control at any remote location or at any number of locations by simple relay and standard push button. Makes possible automatic operation in many machine designs where space limitations or a fixed speed relationship must be met. C-H Magnetic Clutches are made in a wide range of sizes. Consult a Cutler-Hammer engineer.



## Stop it

When machine performance calls for quick stops, it's a job for Cutler-Hammer Magnetic Brakes. The action is smoothly cushioned magnetically, operation is positive and absolutely dependable, control by push button or any automatic contact arrangement. Passenger and freight elevators, huge traveling cranes are typical applications of Cutler-Hammer Magnetic Brakes. Do you have a "stop" problem? Let Cutler-Hammer work with you on its solution.





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